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Central files

REC'D 12 1980
REGISTRATION BRANCH DIVISION

Docket No. 50-255

MEMORANDUM FOR: William T. Russell, Chief
Systematic Evaluation Program Branch
Division of Licensing

THRU: Carl N. Berlinger, Section Leader
Systematic Evaluation Program Branch
Division of Licensing

FROM: Theodore S. Michaels, Systems Section
Systematic Evaluation Program Branch
Division of Licensing

SUBJECT: TRIP REPORT - PALISADES NUCLEAR STATION
NOVEMBER 17-19, 1980

On November 10, 1980, the Consumers Power Company (CP) was notified by letter (Docket No. 50-255, LSCS-80-11-004) of a visit to the Palisades Nuclear Station by staff of the NRC. The purpose of the visit was to observe site specific features of the Palisades Nuclear Station relative to the Systematic Evaluation Program (SEP) structural, electrical and system topic reviews, to obtain information not available to the staff in the Palisades docket, and to discuss open items which were identified based on the staff's seismic review.

CP was provided with a detailed agenda of items that were to be addressed. Detailed responses to these items were provided in Enclosures A-E. Each enclosure contains the questions that were asked (Part I), and the responses to these questions (Part II). The cognizant NRC staff are listed on these Enclosures. Open items that require a response from CP are summarized in Enclosure F.

As a result of the cooperation of the staff of CP, the meeting was productive. A tour of the plant was made and specific locations of interest were observed by individual NRC staff members. The meeting consisted of a main meeting in addition to side meetings on particular items. Enclosure 6 contains a list of attendees at the exit interview held on November 19, 1980.

Theodore S. Michaels
Systematic Evaluation Program Branch
Division of Licensing

Enclosures and cc:
See page 2

8101080118 XA

200 psi. Therefore, there is no need to account for pressure uncertainty in

- 2 -

Enclosures:
As stated

cc w/enclosures:
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G. Laines
T. Manbeck
C. Berlinger
T. Michaels
N. C. Li
R. E. Polk
R. B. Holz
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Docket No. 50-255
NRC POR
Local POR
TERA
NSIC, J. Buchanan

OFFICE	SEP8:DN/CA	SL-SEP8:CA				
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DATE	12/14/80	12/15/80				

NRC FORM 118 (8-76) NRCM 8249

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if these relays failed because the condensate booster pump would not

Mr. David P. Hoffman

PALISADES
DOCKET NO. 50-255

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Table 6-4 summarizes our findings on the sample of mechanical and electrical components and distribution systems that were evaluated to determine the seismic design adequacy of such items required for the safe shutdown of the Palisades nuclear steam supply system. As discussed in Section 6.1 of this report, the sample includes components the review team selected, based on judgement and experience, as representative of lower-bound seismic design capacity of Palisades as well as the grouping of components into representative categories.

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Based upon the design review and independent calculations for the SEP seismic load conditions, we recommend that design modifications or reanalysis may be required for particular mechanical and electrical components in order to withstand the 0.2g SSE without loss of structural integrity as required to perform safety functions. In general, no information has been provided to date which demonstrates the functional adequacy of mechanical and electrical equipment evaluated on the Palisades Plant. The particular mechanical and electrical components which require additional evaluation and possible design modifications are as follows:

*Topic
III-6*

1. Essential Service Water Pumps
2. Auxiliary Feedwater Pumps
3. Diesel Generator Oil Storage Tanks
4. Safety Injection Tanks
5. Motor Operated Valves
6. Control Rod Drive Mechanisms
7. Steam Generators
8. Reactor Coolant Pumps
9. Reactor Vessel and Internals
10. Battery Racks
11. Motor Control Centers
12. Switchgear
13. Control Room Panels
14. Transformers
15. Electrical Cable Raceways

DRAFT

* A separate Part II is not provided for Enclosure A since none of the open items listed in Part I have been resolved.

DRAFT

TABLE 6-4 CONCLUSIONS REGARDING EQUIPMENT REVIEW FOR SEISMIC DESIGN ADEQUACY OF PALISADES

Item	Description	Conclusion and Recommendation
1.	Essential Service Water Pump	O.K. for structural integrity if discharge head stresses are within code allowables (no use of cast iron). Functional integrity has not been evaluated other than in the anchor bolts due to a lack of design detail.
2.	Auxiliary Feedwater Pump	O.K. for structural integrity. Functional integrity has not been evaluated due to lack of design detail.
3.	Component Cooling Heat Exchanger	O.K.
4.	Component Cooling Surge Tank	O.K.
5.	Diesel Generator Oil Storage Tanks	No evaluation has been performed since no drawings or design calculations are currently available.
6.	Boric Acid Storage Tank	O.K.
7.	Hydrazine Tank	O.K.
8.	Sodium Hydroxide Tank	O.K.
9.	Safety Injection Tank	O.K. if tank support structure is rigid. Complex support structure should be evaluated for dynamic characteristics to assure rigidity assumption is correct.
10.	Motor-Operated Valves	Generic analysis on motor-operated valves on lines < 4 inches should be performed to show resulting stresses in the pipe are less than 10% of the applicable Condition B (active) or Condition D (passive) allowable stresses. Otherwise,

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TABLE 6-4 CONCLUSIONS REGARDING EQUIPMENT REVIEW DRAFT DYNAMIC DESIGN ADEQUACY OF PALISADES

Item	Description	Conclusion and Recommendation
10.	Motor-Operated Valves	stresses induced by valve eccentricity should be introduced into piping analysis to verify design adequacy or provide and implement a procedure whereby all motor valves ≤ 4 inches be externally supported. Also, verification of structural adequacy and function of valves themselves have not been demonstrated. (V _u)
11.	Control Rod Drive Mechanism	O.K. for structural integrity based on the existing calculations reviewed; active function cannot be assured.
12.	Pressurizer	O.K.
13.	Steam Generator	Insufficient information provided to verify design adequacy.
14.	Reactor Coolant Pump	Insufficient information provided to verify design adequacy.
15.	Reactor Vessel Supports and Internals	Insufficient information provided to verify design adequacy.
16.	Battery Racks	Racks O.K., with the exception of wooden lateral bracing which should be replaced or strengthened to carry full seismic inertia loads.
17.	Motor Control Centers	Anchorage O.K. No information available to evaluate rack structural adequacy or electrical component functionality.
18.	Switchgear	Anchorage O.K., if anchor bolts are 7/8" ϕ , otherwise possible design modifications may be necessary. No information available to evaluate switchgear rack structural adequacy or electrical component

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6-4 CONCLUSIONS REGARDING EQUIPMENT REVIEW FOR SEISMIC DESIGN ADEQUACY OF PALISADES

Item	Description	Conclusion and Recommendation
19.	Control Room Electrical Panels	Licensee to verify seismic design adequacy.
20.	Transformers	End units of transformers should be anchored with four 1/2" ϕ anchor bolts. No information available to evaluate structural adequacy or electrical functionality.
21.	Electrical Cable Raceways	Cable tray-support systems should be evaluated for seismic loads induced by 0.25 g.

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ENCLOSURE 8 - PART I

PALISADES
NUCLEAR POWER PLANT
REQUEST FOR ADDITIONAL INFORMATION

Additional information is needed for the following:

TOPIC

III-2 WIND AND TORNAO LOADING

Provide the tornado pressure profile used in the design of the structures. Provide the method used to account for the reduction of atmospheric pressure and venting of compartments inside the structure. Do the structures rely on blow out panels to vent the compartments? Are any structures designed to lose external panels in a tornado and if so provide the procedure used to design the supporting structures.

III-3 EFFECTS OF HIGH WATER LEVEL ON STRUCTURES

Provide drawings showing elevations of the finished grade and the structural openings that are near the finished grade. Provide the elevation of the maximum water level predicted for the site including the effects of wave runup. Provide the procedure used to convert water levels to structural loads including wave impact. Provide the load combination equations which considered high water with other loads.

III-4A TORNAO MISSILES

Section 5.1.3.2 (h) of the FSAR shows a list of 5 tornado missiles which were used in the analysis of the containment. Appendix A of the FSAR, which specifies the missiles for other class 1 structures, lists only two of the missiles used in the containment analysis (4x12 wood plank and 4000 lb etc) but with different velocities. Confirm that this was the design conditions or provide the missile set that was used and provide the calculations that show the structural wall withstand the missile impact. In addition, provide the method used to show the walls can withstand the impact. Provide the wall thicknesses and concrete parameters used for the missile barriers calculations. Specify the load combinations that involved the tornado missile and tornado wind with other structural loads on the missile barriers.

III-4B TURBINE MISSILES

Provide the procedure you used to determine the necessary barrier thickness to protect the plant from turbine missiles. Include the criteria used to predict spalling and scabbing.

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ENCLOSURE B - PART I

TOP

III-7C DELAMINATION OF PRESTRESSED CONCRETE CONTAINMENT STRUCTURES

Provide design and/or as-built drawings of the containment dome showing reinforcing placement, including radial steel, tendon locations with end anchorage details, concrete pouring sequence and the tendon tensioning procedure and sequence. The information provided in amendment 14 is not detailed enough. Provide the drawings which show the sequence, tendon by tendon. Provide a copy of procedures used for dome inspection that would assess the likelihood of discovering delaminations in the concrete. Your response of December 14, 1979 did not address this portion of the question.

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ENCLOSURE B - PART II - HAROLD POLK

492-9470

Topic III-2 Wind and Tornado Loading

Discussion by Steve Sobkowski listed the wind and tornado loading for the plant. No blowout panels are relied upon to vent tornado differential pressure. No structures are designed to lose external panels during a tornado. The safety injection storage tank on the roof of the auxiliary building is not designed for wind and tornado loadings.

CP provided additional information on this subject included in Appendix A of this enclosure.

Topic III-3A High Water

The maximum high water level for this site is the combination of 1886 high water level for Lake Michigan of elev. 583.68 feet plus a 6.0 foot seiche. This seiche level was observed in Michigan City, Indiana in 1954 but not near the plant site. Therefore, the maximum water elevation is 589.68 feet. The plant finished grade is Elev. 590 and doors opening to grade are sealed with watertight doors. The containment is sealed. The only items exposed to high water is the windings in the service water pumps which are at 594'-8". This level is 5 feet above maximum high water.

The exterior plant walls were designed to withstand ground water at Elev 585 during construction as free cantilevers with a rectangular hydrostatic pressure instead of the customary triangular. This loading assumption produced higher loads than the actual high water level. The water loads were combined with soil loads and dead weight loads.

CP provided additional information on this subject included in Appendix B of this enclosure.

III-4A Tornado Missiles

The missile spectrum does not match those of SRP 3.5.1.4. A comparison of the design missile was presented along with the necessary exterior wall information to assess the effects of the missiles.

CP provided additional information on this subject included in Appendix C of this enclosure.

III-4B Turbine Missiles

CP provided a handout that cited the FSAR (Page 14-11), which states that no turbine missiles are postulated to be ejected from the turbine casing. Half and quarter disk missiles are postulated at an overspeed condition. It is CP's opinion that this plant configuration if analyzed for turbine missiles using current manufacturer ejection

probabilities would satisfy current acceptance criteria. CP will provide a list of similar plants that have been qualified for turbine missiles.

III-7C Delamination of Prestressed Concrete Containment Structures

Drawings of tendon placement, post tensioning, sequence and reinforcing steel of the dome were provided. Concrete pouring sequence of the dome was also provided. Inspection by Bechtel Engineers in September 1970 did not show any evidence of delamination. The licensee will provide documentation of tendon tensioning and pressure testing dates.

CP provided additional informations on this subject included in Appendix D of this enclosure.

ENCLOSURE B - PART II - APPENDIX A

Topic III-2

WIND AND TORNADO LOADING

1. Current acceptance criteria versus Palisades design

	<u>FSAR</u>	<u>Current</u>
Differential pressure	3 psi	3 psi (RG 1.76)
Wind	300 + 60 mph	290 + 5 to 70 mph (RG 1.76)

2. Calculations

No venting calculations were located.

No blowout panels are utilized for tornado venting.

- a. Containment - seismic controls (FSAR Page 5-13)
- b. Auxiliary building - enclosure of diesel generators, switchgear, cable spreading area, and control room - 0.662 ksf tornado load
- c. Auxiliary building addition - 0.6 ksf tornado load
- d. Intake structure - 0.432 ksf tornado load
- e. Electrical penetration room - 0.432 ksf tornado load
- f. Auxiliary feed pump enclosure - no calculations located (This structure is below grade.)

OFFICE ▶ LC DPT
PURCHASE ▶ R Campbell, Inc.
DATE ▶ 12/5/80

LC DPT
R Campbell, Inc.
12/5/80

Stanley
12/5/80

W
E.C. Co.
12/6/80

H. Co.
12/6/80

W. Co.
12/6/80

ENCLOSURE B - PART II - APPENDIX B

Topic III-3.A

EFFECTS OF HIGH WATER LEVEL ON STRUCTURES

1. FSAR

The maximum water level predicted at the site is the 1,886 high, Elevation 583.68 feet (USGS). If the Michigan City, Indiana, 1954 6-foot seiche (not observed near the plant site) is added to this elevation, there is a maximum transitory water elevation of 589.68 feet at the plant site (reference FSAR Section 2.2.2). Therefore, flooding at the site is not postulated (FSAR Appendix A and Amendment 15, Question 2.4).

2. Calculations

A ground water elevation of at least 585 feet was considered in the design of walls of safety-related structures. This load was considered in conjunction with normal surcharge and soil pressures.

3. Plant Configuration

The plant finish grade is at Elevation 590 feet (USGS). The containment is sealed. Openings in the auxiliary building and auxiliary building addition at Elevation 590 feet are sealed with watertight doors (Drawings C-45, C-48, and C-326). Openings in the auxiliary feed pump enclosure are sealed. The service water pumps in the intake structure are operable to an elevation of 594'-8".

Safety functions are not degraded to a water elevation of 594'-8". This is a margin of 5 feet over the postulated plant high water level.

ENCLOSURE 3 - PART II - APPENDIX C

Topic III-4.A

TORNADO MISSILES

1. Current tornado missiles versus Palisades design

	<u>PSAR</u>	<u>SRP</u>
Wood plank, 4" x 12"	76 lb, 760 fps	200 lb, 442 fps
Steel pipe, 3 inches	76 lb, 620 fps	78 lb, 211 fps
Steel rod, 1 inch	NA	8 lb, 316 fps
Steel pipe, 6 inches	NA	215 lb, 211 fps
Steel pipe, 12 inches	NA	743 lb, 211 fps
Utility pole	NA	1,490 lb, 211 fps
Automobile	4,000 lb, 450 fps	4,000 lb, 105 fps
Flatcar	40 k, 480 fps	NA
Locomotive	240 k, 310 fps	NA
Boxcar	47.3 k, 500 fps	NA

2. Calculations

Calculations checked for penetration using the modified Petry equation (reference Standard Review Plan (SRP) 3.5.3). This conforms with current SRP acceptance criteria.

Missile effects were considered to act without other concurrent loadings.

- a. Containment - All missiles did not penetrate except for the flatcar below Elevation 649'.
- b. Auxiliary building below Elevation 649' - did not resist 3-inch pipe, flatcar, and locomotive.
- c. Intake structure - reduced velocities to one half of those shown above. Analysis for the plank, 3-inch pipe, and automobile showed no penetration.
- d. Auxiliary building addition, containment penetration room and auxiliary feed pump enclosure - no missile calculations located

ENCLOSURE B - PART II - APPENDIX C

Topic III-4.1

Tornado Missiles (cont'd)

3. Structural properties

The following minimum external wall thicknesses and concrete strengths are provided:

- a. Containment - $f'_c = 5 \text{ ksi}$, 3'-6"
- b. Auxiliary building below elevation 649' - $f'_c = 3 \text{ ksi}$, 1'-6"
- c. Auxiliary building addition - $f'_c = 3 \text{ ksi}$, 2'-0"
- d. Intake structure - $f'_c = 3 \text{ ksi}$, 2'-0"
- e. Containment penetration room - $f'_c = 3 \text{ ksi}$, 2'-0"
- f. Auxiliary feed pump enclosure - (This structure is below grade.) $f'_c = 3 \text{ ksi}$

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ENCLOSURE B - PART II - APPENDIX D

Topic III-7.C

DELAMINATION OF PRE-STRESSED CONCRETE CONTAINMENT STRUCTURES

1. Design Drawings

Reinforcing Placement - Dwg 5935 C-13a Rev. a

Tendon Locations - Dwg 21711A PT-18, Dome Tendons
Layer Arrangement & Spacing

Tendon Installation - Dwg 21711- PT-5, Tendon Installation Schematic

Tensioning Sequence - Dwg 21711- PT-112, Post Tensioning Sequence
Dome Tendons

2. Delamination Discussion

There is no radial steel provided.

If delamination were to occur, it would happen when the through thickness tension was a maximum. This maximum tension occurs when the post-tensioning force is a maximum. The post-tensioning force is a maximum when the tendons are initially stressed.

There was no evidence of delamination at the initial stressing of the tendons.

After the occurrence of delamination at other plants, two Bechtel employees (Johnson and Windhal) inspected the dome for evidence of delamination (Sept 1970). No evidence of delamination was found in this inspection.

ENCLOSURE C - PART I

Topic III-4.C Internally Generated Missiles

The FSAR addresses only internally generated missiles for containment. Special Report No. 6, "Analysis of Postulated High Energy Line Breaks Outside of Containment" issued by Consumers' Power on May 1, 1973 and revised July 13, 1973 is not complete with respect to missiles. SRP 3.5.1.1 addresses this subject for areas outside containment.

1. Arrange a tour of areas outside containment where protection against internally generated missiles has been provided.
2. Discuss or provide references for barrier design details and criteria.
3. Arrange a tour of areas outside containment where potential missiles as described in SRP 3.5.1.1 exist and where no barriers are provided. Discuss or provide references for the determination that missile protection is not required.

ENCLOSURE C - PART 1:

Howard Holz
49-27648

SEP II:-4.C
Internally Generated Missiles (Outside of Containment)
SRP 3.5.1.1

The Standard Review Plan (SRP 3.5.1.1) is derived in part from GDC 4 (10 CFR 50 Appendix A) with respect to protecting essential systems and components against the effects of internally generated missiles outside of containment to maintain their safety function. Other GDC and SRP sections are also involved as required for consistent logic which is to assure that there always exists a way to remove the decay heat from the reactor and its fuel storage pool. It is also required that these safety related systems be placed in operation in a timely manner before a more degrading situation develops. These auxiliary systems for Palisades are:

- 1) Auxiliary Feedwater System
- 2) Service Water System to and from Lake Michigan (backup system is fire system)
- 3) Component Cooling Water System to and from Service Water System
- 4) Fuel Storage Cooling Water System
- 5) Borated Water System

These systems were traced in the as built condition in the plant, insofar as practical, exterior to the containment but within other buildings or using Engineering Drawings where assessability in the plant was not practical.

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Even though the NRC SRP was released 3 years after Palisades received its operating license, a substantial portion of today's guidance (SRP and Reg. Guides) is evident in the Palisades as built design. At E1. 570 the equipment arrangement drawings locate the high pressure safety injection pumps, low pressure safety injection pumps and containment spray pumps. They are clustered in a 1:2 configuration with an 18" thick concrete wall between the two clusters such that a major piping or component failure in one room, which might generate a missile is not likely to cause damage to components or systems in the other adjacent room. The small pumps are usually fixed or variable positive displacement pumps. Intermediate size pumps are mostly mixed flow centrifugals and the large service water pumps are vertical high volume low head pumps. The exception to the above statement is the auxiliary feedwater system pumps. These pumps generate a high head with an intermediate size flow (hundreds of gpm). We do not believe any of the electric driven pumps in the systems being evaluated would be likely to exceed synchronous speed for AC motors and retain sufficient kinetic energy to penetrate a thick cast steel case surrounding the rotating elements. The turbine in the auxiliary feedwater system is a Terry Turbine, a single stage, and controlled by a mechanical governor set at a constant speed of 3400 rpm for either shut off or with a pumping load. Its performance has been satisfactory and no overspeed trips have occurred in the past 5 years of operation.

Enclosure C - Part II

OFFICE: 518-16
PERSONNEL: ROOFMAN-NS
DATE: 12-15-80

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12/15/80

We conclude, for the systems identified at the beginning of this enclosure, that through discussions with the licensee, the licensee's contractors and physical investigation at the site by NRC representatives that the as built design of the facility has inherent features resulting from the location and placement of equipment such that a missile from a single source is unlikely to inundate alternate heat removal paths. Secondly, the kinetic energy in rotating elements nearby the aforementioned heat removal paths is insufficient to penetrate its own surrounding structural envelope and that of alternate heat removal paths.

With respect to the main turbine which is not oriented so that the rotating elements are directed away from the reactor and its heat removal system a low trajectory element would have many barriers in its way before it could reach one critical heat removal path or pump.

The staff concludes that the structures, components and systems to be protected from internally generated missiles (outside containment) conform to the Commission's regulations as set forth in General Design Criterion 4 and the objectives of SRP 3.5.1.1.

Enclosure C - Part II

ENCLOSURE 3 - PART 1
REQUEST FOR ADDITIONAL INFORMATION ON
PALISADES FOR SEP TOPIC VII-3

The information provided in response to our letter of February 14, 1980 does not adequately address GDC 19 requirements for remote shutdown capability. Provide a description of the facilities provided for remote shutdown including the following information:

- (1) Identify the systems and instrumentation and control equipment that are required to bring the plant to a hot shutdown from outside of the control room and the equipment which is required to maintain it in this condition.
- (2) For all actions which are to be performed in a shutdown from outside of the control room:
 - (a) Identify where the operation and its associated control and indicators are physically located (e.g. Auxiliary Shutdown Panel, MCC, manual operation of a valve etc.).
 - (b) Provide the drawings which show the location and identification of the control boards and equipment located thereon, and equipment and locations within the control room that support the description of how General design condition 19 is implemented in the plant.
 - (c) Confirm that proper procedural guidance for modification of controls and instrumentation that may be modified as actual abnormal conditions dictate will be prepared in advance, approved as necessary, and available when required.
- (3) Identify each circuit that contains a transfer switch.
- (4) Provide plant layout sketches that show where the switches are located.
- (5) Describe the method that will be used to seal the transfer switches.
- (6) Describe the consequences of an inadvertent actuation of one or more of the switches.
- (7) Identify and justify each transfer switch that is not wired to the bypassed and inoperable status indication system.

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(8) Describe the methods and indications available outside of the control room by which the operator can:

- (a) verify relief valve operation;
- (b) determine reactor pressure, temperature, and coolant level;
- (c) determine containment pressure; and
- (d) determine service water flow and temperature through the EXR heat exchangers.

Enclosure J - Part I

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ENCLOSURE D - PART II

Topic VII-3

MULBERT LI - 492-9433

The following information was obtained during the site visit:

A panel layout of a Local Control Panel C-33, redundant engineered safeguard instruments, which is located on a floor at EL. 590' in the same room that the Safety Systems 480 volts motor control centers No. 7 and No. 8 are located was provided (Main Control room is two floors above this room at EL. 625'). This panel has two sections with a fire barrier inside the panel. Each section has ten indicators on the top and 36 valve control switches on the panel. Each section has a separate power source. Each section has ten indicators on the top and 36 valve control switches on the panel. There is no pump control capability on this panel. The switch circuits on this panel are in parallel with the switches on the main control board. Therefore, the control functions are not transferred from the main control board to the local panel and vice versa. The valve positions are indicated on the panel above the corresponding switches. The licensee stated that this panel will be modified due to TMI-2 action plan requirements.

Emergency Operating Procedure (EOP)-10 was provided, which deals with control room evaluation.

In addition the licensee provided the following oral response to the remote shutdown panel questions in Part I of Enclosure B.

- 1) Identified in Emergency Operating Procedure, EOP-10.
- 2) (a) Identified in emergency procedure EOP-10 and local Panel C-33.
(b) See Equipment location drawing M-1 through M-15.
(c) Identified in emergency procedure EOP-10.
- 3) Local panel C-23 contains switches that can be operated for plant shutdown procedure. Since circuits for these switches on C-33 are in parallel with the switch circuit on the main control board, it is not transferring the control function from the main control board to the local panel and vice-versa.
- 4) Not applicable to Palisades design.
- 5) Not applicable to Palisades design.
- 6) Either switch can perform the intended function. There are valve position indications on both panels.
- 7) There is no automatic bypassed and inoperable status panel (system level indication) in Palisades. It is done by administrative procedures.
- 8) (a) No relief valve indication is provided outside the control room.
(b) Reactor pressure is on C-33 panel. Reactor coolant hot leg temperature is on C-33 panel. Pressurizer level indication is on C-33 panel.

DATE	11/11/80	TIME	11:18
BY	Sherran	BY	Elzie
TO	Office	TO	Office

- (c) No containment pressure indication is provided outside the control room.
- (d) No service water flow or temperature indication is provided outside the control room.

Central File

ENCLOSURE E - PART I

Questions - Palisades System

Topic

1. Discuss the following design modifications with respect to instrumentation status, setpoints, and/or technical specification changes IX-2
 - a) automatic isolation of main feedwater on low steam generator pressure by closure of main feed regulating and bypass valves
 - b) automatic initiation of auxiliary feedwater on low suction flow to the main feed pumps or on closure of feed pump turbine stop valves
 - c) auxiliary feedwater flow controller limit and time delay on initiation
 - d) containment spray modifications to resolve LER 80-003
 1. MSIV closure time
 2. resequencing of diesel loads
 3. partial filling of containment spray piping

2. Briefly explain how auxiliary feed flow controller works, its susceptibility to failure, and the effect of failure on auxiliary feed flow delivery to generator, considering the cause with a steam or feed line break as well as for an intact system. IX-2, IX-6

3. Is the setpoint for MSIV closure on high containment pressure the same as for reactor trip, safety injection and containment isolation? IX-2

4. Discuss normal lineup for HPSI system with respect to HPSI header and redundant HPSI header IX-2, IX-19
 - a) Which pumps discharge to each header
 - b) What are the injection mode positions of valves:

CY3036	MOY3062
CY3037	MOY3064
MOY3018	MOY3066
CY3059	MOY3068
 - c) What is failure position on loss of air or power of:

CY3036	CY3037	CY3059
--------	--------	--------
 - d) Which diesel generator supplies each of the following loads:

HPSI Pump	P66A
	P66B
	P66C
LPSI Pump	P67A
	P67B
Containment Spray Pump	P54A
	P54B
	P54C

- | | |
|---------|---------|
| MOY3007 | MOY3008 |
| MOY3009 | MOY3010 |
| MOY3011 | MOY3012 |
| MOY3013 | MOY3014 |
| MOY3062 | |
| MOY3064 | |
| MOY3066 | |
| MOY3068 | |

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Note: If preferred, confirm whether the listed drawings are current, and if not, provide an updated copy.

E-3 Rev L 1/4/79
E-4 Rev J 1/4/79 (Sheet 1)
E-5 Rev S 1/4/79 (Sheet 1)

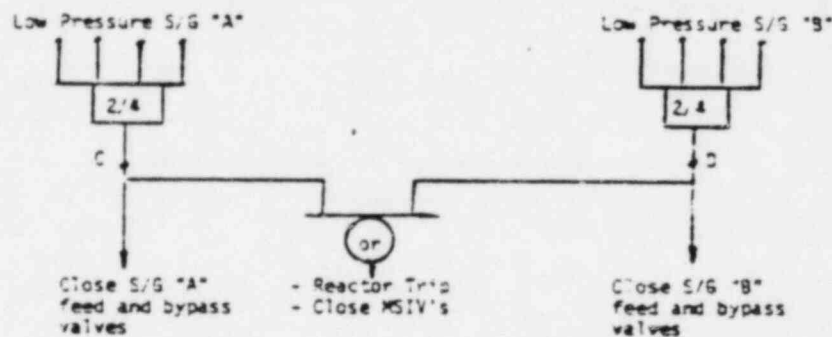
e) What is the power source (control and/or motive power) for CY3C36, CY3C37, CY3C59, and MOV3C18?

POOR ORIGINAL

Enclosure E - Part 1

ENCLOSURE E - PART IIT. MICHAELS 492-8172II: Response

1(a) The logic diagram provided by Consumers Power for control of main feedwater regulating and bypass valves is as follows:



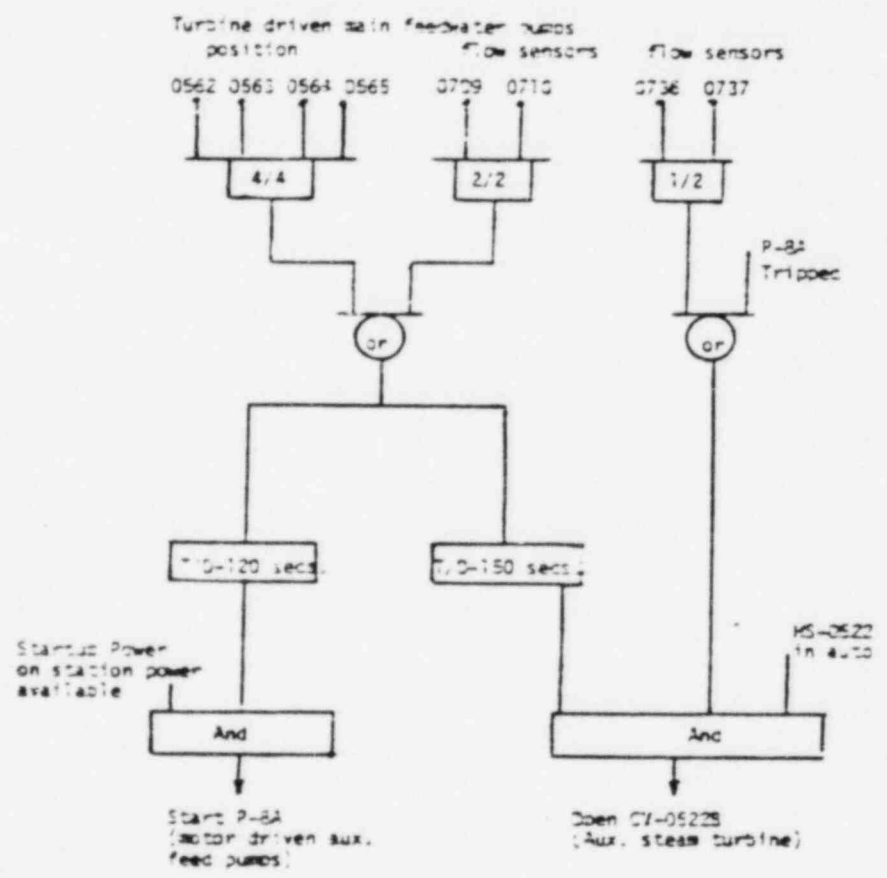
From the above diagram, it is seen that low pressure on any two sensors of steam generator (S/G) "A" would close the S/G "A" feed and bypass valves, trip the reactor and close the MSIV's. The same is the case for S/G "B".

The setup is not necessarily single failure proof because the signal to close either S/G "A" or "B" feed and bypass valves depends on a relay which is located at point C or D. However, Emergency Operating Procedure (EOP) 7 provides a backup in case this relay fails to operate. Moreover, without offsite power there would be no problem



if these relays failed because the condensate booster pump would not operate with loss of offsite power. The setup is safety grade (same as plant).

1(b) The logic diagram provided by Consumers Power for automatic initiation of auxiliary feedwater on low suction flow to the main feed pump or on closure of feed pump turbine stop valves is as follows:



This is the setup as it exists today. If 4/4 of the main feedwater turbine stop valves are closed (0562-056E) or if 2/2 Flow Sensors (FS) (0709, 0710), sense low suction flow to the main feed pumps, the motor driven auxiliary feed pump will be energized after 120 seconds (provided that start up power or station power is available). The valve to the auxiliary steam turbine will be opened after 150 seconds if the motor driven auxiliary feed pump was not energized (P-BA tripped) or if there is low flow in 1/2 FS sensors (0736, 0737) in the auxiliary feed line downstream of the auxiliary feed pump and the set up was in auto (MS 0522).

Because of a TMI related item the logic will be revised so that sensing for this logic will be low level on the S/S with 2/4 logic.

The motor driven auxiliary feed pump will not be automatically sequenced onto diesel power.

Open Item

Consumers Power is to provide documentation as to whether the auxiliary pumps can be manually sequenced on to diesel power.

1(c) The auxiliary feedwater flow controller limit is 150 gpm and the delay time on initiation is 120 seconds (electric) and 150 seconds (turbine).

1(d) The MSIV closure time is 5 seconds cold and less than 1 second hot.

The resequencing of diesel loads is as follows:

Containment spray pumps	2 secs (was 9 secs)
HPSI pumps	6 secs (was 2 secs)
Service water pumps	9 secs (was 6 secs)

The containment spray piping will be filled to the 735 level.

Technical specification changes to MRC will be proposed.

2. The auxiliary feed flow controller is a Foxboro controller and its operation is described in the response to IE Bulletin 80-04.
3. The setpoint for MSIV closure for high containment pressure is 5 psi which is the same as reactor trip, safety injection and containment isolation.
- 4(a) High pressure Safety Injection Pumps P-66B and P-66C discharge to the main header and P-66A discharges to the redundant header.
- (b) The injection mode positions of the valves are shown on Dwg P-204 and are as follows:

CV 3036 - Open (O)	MOV 3062 - 0
CV 3037 - Closed (C)	MOV 3064 - 0
CV 3018 - C	MOV 3066 - 0
CV 3059 - 0	MOV 3068 - 0

(c) The failure position of the following valves is as follows:

CV 3036 - 0 CV 3037 - C CV3059 - 0 CV3018 - C

(d) The diesel generator that supplies the following loads is as follows:

HPSI Pump	P66A 1-2 (bus 1 D)
	P66B 1-1 (bus 1 C)
	P66C 1-2

LPSI Pump	P67A 1-2
	P67B 1-1

Containment Spray Pump	PS4A 1-2
	PS4B 1-1
	PS4C 1-1

HPI	MOV 3007 1-1
LPI	MOV 3008 1-1
HPI	MOV 3009 1-1
LPI	MOV 3010 1-1
HPI	MOV 3011 1-1*
LPI	MOV 3012 1-2
HPI	MOV 3013 1-1*
LPI	MOV 3014 1-2
HPI	MOV 3052 1-2*

HPI	MCV 3064 1-2*
HPI	MCV 3066 1-2
HPI	MCV 3068 1-2

*It is noted that a Consumers Power Co. memorandum from R.D. Sherwin to J.R. Yope, January 31, 1979, requested that the power supply for these valves be changed to the status as shown and that it be made during a refueling outage. The change has been made but is not reflected in Revision 19 (1-9-80) of Drawing No. E-5.

Updated copies of the following drawings were obtained:

E-3 Rev 14	9/3/80
E-4 Rev K	6/5/80
E-5 Rev 19	2/9/80

e) The power source and control for the following valves is as follows:

CV 3036 -	021, 72-210
CV 3037 -	021, 72-210
CV 3059 -	011, 72-110
CV 3018 -	011, 72-110

- 2 -

ENCLOSURE F

OPEN ITEMS

ENCLOSURE A

All items previously identified as open are still open (See Enclosure A).

ENCLOSURE B - ITEM III-48, Turbine Missiles

The licensee will provide a list of similar plants which have been qualified for turbine missiles.

ENCLOSURE B - ITEM III-70, Delamination of Prestressed Concrete Containment Structures

The licensee will provide documentation of tendon tensioning and pressure testing dates.

ENCLOSURE D

The licensee will provide a report on the exercising of Emergency Operating Procedure (EOP)-10 when the alternate shutdown panel and other fire protection related modifications are completed.

ENCLOSURE E

The licensee will provide documentation as to whether the auxiliary feed pumps can be manually sequenced onto diesel power.

ENCLOSURE G

ATTENDEES, MEETING AT PALISADES SITE

NOVEMBER 19, 1980

R. E. McCaleb	CPCO	QA Administration
Jim Kuehn	CPCO	Engr. SEP
R. A. Vincent	CPCO	MAO-HLS
S. Sobkowski	Bechtel	Eng.
Hulbert C. Li	NRC	NRR/ICSB
Harold Polk	NRC	NRR/SEB
Theodore Michaels	NRC	NRR/SEP
Thomas E. Leva	CPCO	Tech Dept.
Paul K. Smith	Bechtel	Eng.
Howard B. Holz	NRC	NRR/ASB
Bill Beckius	CPCO	MAO/SEP
Thomas Cheng	NRC	NRR/SEPB
Howard J. Palmer, Jr.	CPCO	Technical Supt.
W. T. Russell	NRC	NRR/SEP

A. PIPING STRESS ANALYSIS DATA

1) Pipe Program - Tensar Safety Related Non Safety Related
 2) Type of Condition Analysis
 3) Other Comments

B. Piping Data

	1	2	3	4
1) Line Classification				
2) Line Identification				
3) Mod of Elasticity (10^6 psi)				
4) Expansion Coef (in/in/°F)				
5) Expansion Coef (in/in/in)				
6) Pipe ID				
7) Pipe Ser. Wall Thick (in)				
8) Pipe Wall Thick (in)				
9) Operating Pressure (PSI)				
10) Design Temperature (°F)				
11) Design Pressure (PSI)				
12) Pipe Weight (lbs/ft)				
13) Content Weight (lbs/ft)				
14) Insulation Weight (lbs/ft)				
15) Total Weight (lbs/ft)				
16) Sc (PSI)				
17) Sh (PSI)				
18) Sy (PSI)				

- C. INPUT SOURCE DOCUMENTS:**
- 1) Piping specifications
 - 2) Response Spectra Curve Identification
 - 3) Piping Class Summary
 - 4) Piping Class Sheets
 - 5) Piping Code
 - 6) P & ID
 - 7) Piping Drawing
 - 8) Modal Damping Factor
 - 9) Reference Calculation No. 0330

THIS DOCUMENT CONTAINS
 PROPRIETARY INFORMATION

ACTION	NAME	SIGNATURE	DATE
ANALYSIS BY	B. FENNER JR.	[Signature]	7/17/50
CHECKED BY	B. FENNER JR.	[Signature]	7/17/50
APPROVED BY	H. TSENG	[Signature]	7/22/50

Item	Description
1	STD. STRAP FOR 2" O.D. PIPE S2L
2	1/4" O.D. BOLT W/WASHER & NUT (2 REQ'D)
3	L 2" x 2" x 1/4" x 8" LG.



PROJECT Palladas Excellent Plants SHEET 3 OF 4
 JOB NO 11447-032 PLANT DESIGN GROUP
 SYSTEM MANUFACTURING
 CALC NO 11447-032-003 ISO NO 11447-032-003 REV NO 1

1. WEIGHT ANALYSIS DATA

a. Valve Data

- 1) Valve Size and Number
- 2) Length of Valve (L) (ft)
- 3) Corner Valve Length (ft)
- 4) Weight of Valve Body (lbs)
- 5) Weight of Valve Operator (lbs)
- 6) Weight of Corners (lbs)
- 7) Weight of Insulation (lbs)
- 8) Total Weight (lbs)

	1	2	3	4	5	6	7	8
1)	24	17	15					
2)	9	2	4					
3)	2	2	2					
4)	100	50	50					
5)	5	5	5					
6)	4	4	4					
7)	1	1	1					
8)	122	88	87					

9) Per C.G. Summary

	1	2	3	4	5	6	7	8
9)	122	88	87					

2. INPUT SOURCE DOCUMENTS

- a. Piping Specification
- b. Valve Drawings

c. Calculation

A. VALVE WEIGHT IS TAKEN FROM CRUCO 950 W 39 (271), AND MEMO DATED 3/17/80 AND 3/18/80.
 B. VALVE WEIGHT IS TAKEN FROM WALKORTH CATALOG #130, PAGE 115 FIG 9292 WE AND CRUCO 450 W 22, DATE 100, SIC. 25 AND 24.
 ** ASSUME WEIGHT OF OPERATOR TO BE 1/2 OF VALVE ASSEMBLY WEIGHT.
 * VALVE INSULATION WEIGHT FACTOR IS BASED ON GRADE-CATALOGS, PIPE HANGER LOGS AND ENGINEERING.

ACTION	NAME	SIGNATURE	DATE
CALCULATION BY	E. J. JONES	E. J. JONES	7-1-80
CHECKED BY	E. J. JONES	E. J. JONES	7-17-80
APPROVED BY	H. J. JONES	H. J. JONES	7/22/80

a (lbs) b (lbs) c (lbs) d (lbs) e (lbs) f (lbs) g (lbs) h (lbs) i (lbs) j (lbs) k (lbs) l (lbs) m (lbs) n (lbs) o (lbs) p (lbs) q (lbs) r (lbs) s (lbs) t (lbs) u (lbs) v (lbs) w (lbs) x (lbs) y (lbs) z (lbs)



CALCULATION SHEET

OPERATOR Bill Green DATE 7/1/62 CHECKED ... DATE ...
 PROJECT Palisades Nuclear Plant JOB NO. 12447-022
 SUBJECT Anchor, Restraint and Hossie Loads & Stiffness

MEMBER NO.	X (In)	Y (In)	Z (In)	FX (Lbs)	FY (Lbs)	FZ (Lbs)	MX (In-Lbs)	MY (In-Lbs)	MZ (In-Lbs)	R (In)	T (In)	R (In)
15	1528	-792	-1437	-1437	-792	6721	6721	1714	1714	-706	706	1451
16	1159	-271	-1269	-1269	-271	6420	6420	1705	1705	-843	843	1481
17	17	-447	12	12	-447	-209	-209	1008	1008	19	19	110
18	800	135	158	158	135	637	637	1186	1186	14	14	98
19	618	370	216	216	370	1274	1274	2377	2377	28	28	116
20	2	-502	-10	-10	-502	83	83	644	644	11	11	130
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0

*Friction is based on a 3 in Deadload Reaction
 Computer Run No. 12447-022

1	50 U Bolt For 2" P. 18 S.	(1800)
2	L 2x2x1/4 @ 0-8 1/2" L	(1800)
3	3" Concrete Formers	(1800)



CALCULATION SHEET

OPERATOR: Bill Crane **DATE:** 7/1/70 **CHK NO:** 22581/5 **REV NO:** 2
PROJECT: Palladium Reactor Plant **CHK'D:** _____ **DATE:** _____
SUBJECT: Anchor, Restraint and Nozzle Loads & Moments **CHK NO:** 12447.000
REV NO: _____ **DATE:** _____

REV. NO.	DESCRIPTION	Rx (lba)	Ry (lba)	Rz (lba)	Mx (ft-lba)	My (ft-lba)	Mz (ft-lba)	Rx (lba)	Ry (lba)	Rz (lba)
1	895 THERMAL	642						0.0	0.0	0.0
	DEADLOAD	614						0.0	-199	0.0
	ORF ± (H)	-44						0.0	0.0	0.0
	ARE ± (H)	1703						0.0	0.0	0.0
	*FRICTION	3486						0.0	0.0	0.0
	Hydro	17						0.0	0.0	0.0
	899									
	THERMAL	0						-149	-151	114
	DEADLOAD	0						-150	-151	100
	ORF ± (H)	-720						-150	-151	100
	ARE ± (H)	0						0.0	0.0	0.0
	*FRICTION	0						0.0	0.0	0.0
	Hydro	-1491						0.0	0.0	0.0
	900									
	THERMAL	314						0.0	0.0	0.0
	DEADLOAD	357						0.0	0.0	0.0
	ORF ± (H)	-917						0.0	0.0	0.0
	ARE ± (H)	759						0.0	0.0	0.0
	*FRICTION	518						0.0	0.0	0.0
	Hydro	-87						0.0	0.0	0.0
	901									
	THERMAL	0						0.0	0.0	0.0
	DEADLOAD	-450						0.0	0.0	0.0
	ORF ± (H)	0						0.0	0.0	0.0
	ARE ± (H)	0						0.0	0.0	0.0
	*FRICTION	0						0.0	0.0	0.0
	Hydro	-485						0.0	0.0	0.0

*Friction is based on 1/4 Deadload Reaction
 Computer Run No. 1277100

PROJECT FALCONET MILITARY PLANT SHEET 2 OF 25
 JOB NO 11441-C-2 PLANT DESIGN GROUP
 SYSTEM Hot Steam and Air
 CALC NO 635-C-13 P&C NO 11441-C-13 REV NO 1

A. PIPING STRESS ANALYSIS DATA

- 1) Pipe Program - Revision ME G T. S. S. Safety Related Non Safety Related
 2) Thermal Condition Analysis Steady State Full Full
 3) Other Conditions None Weight Seismic Inertia
 Seismic Anchor Load Dynamic Transients

B. Piping Data

- 1) Piping Configuration
 2) Material Specification
 3) Mod. of Elements 10¹⁰ psi
 4) Expansion Coef. 6.7E-6
 5) Expansion Coef. Ind. Min.
 6) Pipe OD
 7) Pipe Ins. Wall Thickness
 8) Operating Temp 700
 9) Operating Pressure (PSI)
 10) Design Temperature (°F)
 11) Design Pressure (PSI)
 12) Pipe Weight (lbs/ft)
 13) Content Weight (lbs/ft)
 14) Insulation Weight (lbs/ft)
 15) Total Weight (lbs/ft)
 16) S_c (PSI)
 17) S_t (PSI) 15000
 18) S_y (PSI) 15000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1)																		
2)																		
3)																		
4)																		
5)																		
6)																		
7)																		
8)																		
9)																		
10)																		
11)																		
12)																		
13)																		
14)																		
15)																		
16)																		
17)																		
18)																		

C. INPUT SOURCE DOCUMENTS:

- 1) Piping specifications ASME B31.1-1975
 2) Response Spectra Curve Identification ASME B31.1-1975
 3) Piping Class Summary ASME B31.1-1975 Rev 9
 4) Piping Class Sheets ASME B31.1-1975 Rev 7
 5) Piping Code ASME B31.1-1975, ASME B31.7-1975 & P&C
 6) P & ID ASME B31.1-1975 Rev 1
 7) Piping Drawing ASME B31.1-1975 Rev 9
 8) Modal Damping Factor 0.5 % of critical damping
 9) Reference Calculation No. 6331C

ACTION	NAME	SIGNATURE	DATE
ANALYSIS BY	E. C. ...	E. C. ...	7/10/80
CHECKED BY	G. E. ...	G. E. ...	7/21/80
APPROVED BY	A. T. ...	A. T. ...	7/22/80

Item	Description	
1	50 U-Bolts For 2" Pipe Size	(18105)
2	12 x 2 x 1/2 x 0.5 x 1/4	(18120)
3	2" Concrete Fasteners	(18100)



PROJECT Palladasa Engine Parts SHEET 9 OF 15
 JOB NO 11001-015 PLANT DESIGN GROUP
 SYSTEM MAN POWER OF 8" 1" 2"
 CALC NO 11001-015 ISO NO 11001-015 REV NO 1

1. WEIGHT ANALYSIS DATA

a. Valve Data:

1) Valve Size and Number					
2) Length of Valve (H.E.)	In	-	-	14	-
3) Operator Valve Length	In	-	2.5	-	-
4) Weight of Valve Body	Lbs	-	1.6	2.5	2.5
5) Weight of Valve Operator	Lbs	-	-	-	-
6) Weight of Connectors	Lbs	-	-	2.72	-
7) Weight of Insulation	Lbs	2.4	2.4	2.4	2.4
8) Total Weight (lbs)		2.4	4.0	5.2	4.9

9) See C.B. Drawing

b. Other Concentrated Weights

2. INPUT SOURCE DOCUMENTS

a. Piping Specification

b. Valve Drawings

c. Catalog

ALL THE WEIGHTS LISTED IN THIS WEIGHT ANALYSIS SHEET
 WERE OBTAINED FROM THE WEIGHT DATA IS LISTED IN THE GENERAL
 CATALOG. THE WEIGHTS WERE OBTAINED FROM THE CATALOG.

ACTION	NAME	SIGNATURE	DATE
CALCULATION BY	G. Edson		7/6/50
CHECKED BY	G. Edson	N. J. Jones	7/11/50
APPROVED BY	N. J. Jones	N. J. Jones	7/22/50

QTY	DESCRIPTION	REMARKS
1	1/2" F.B.S. / Nut	(1 Req'd)
2	1/2" x 3/4" x 9"-7" Lg.	(1 Req'd)
3	1/2" COMPRESS FASTENERS	(2 Req'd)

1 (lbs) 2 (lbs) 3 (lbs) 4 (lbs) 5 (lbs) 6 (lbs) 7 (lbs) 8 (lbs) 9 (lbs) 10 (lbs) 11 (lbs) 12 (lbs) 13 (lbs) 14 (lbs) 15 (lbs) 16 (lbs) 17 (lbs) 18 (lbs) 19 (lbs) 20 (lbs) 21 (lbs) 22 (lbs) 23 (lbs) 24 (lbs) 25 (lbs) 26 (lbs) 27 (lbs) 28 (lbs) 29 (lbs) 30 (lbs) 31 (lbs) 32 (lbs) 33 (lbs) 34 (lbs) 35 (lbs) 36 (lbs) 37 (lbs) 38 (lbs) 39 (lbs) 40 (lbs) 41 (lbs) 42 (lbs) 43 (lbs) 44 (lbs) 45 (lbs) 46 (lbs) 47 (lbs) 48 (lbs) 49 (lbs) 50 (lbs) 51 (lbs) 52 (lbs) 53 (lbs) 54 (lbs) 55 (lbs) 56 (lbs) 57 (lbs) 58 (lbs) 59 (lbs) 60 (lbs) 61 (lbs) 62 (lbs) 63 (lbs) 64 (lbs) 65 (lbs) 66 (lbs) 67 (lbs) 68 (lbs) 69 (lbs) 70 (lbs) 71 (lbs) 72 (lbs) 73 (lbs) 74 (lbs) 75 (lbs) 76 (lbs) 77 (lbs) 78 (lbs) 79 (lbs) 80 (lbs) 81 (lbs) 82 (lbs) 83 (lbs) 84 (lbs) 85 (lbs) 86 (lbs) 87 (lbs) 88 (lbs) 89 (lbs) 90 (lbs) 91 (lbs) 92 (lbs) 93 (lbs) 94 (lbs) 95 (lbs) 96 (lbs) 97 (lbs) 98 (lbs) 99 (lbs) 100 (lbs)



CALCULATION SHEET

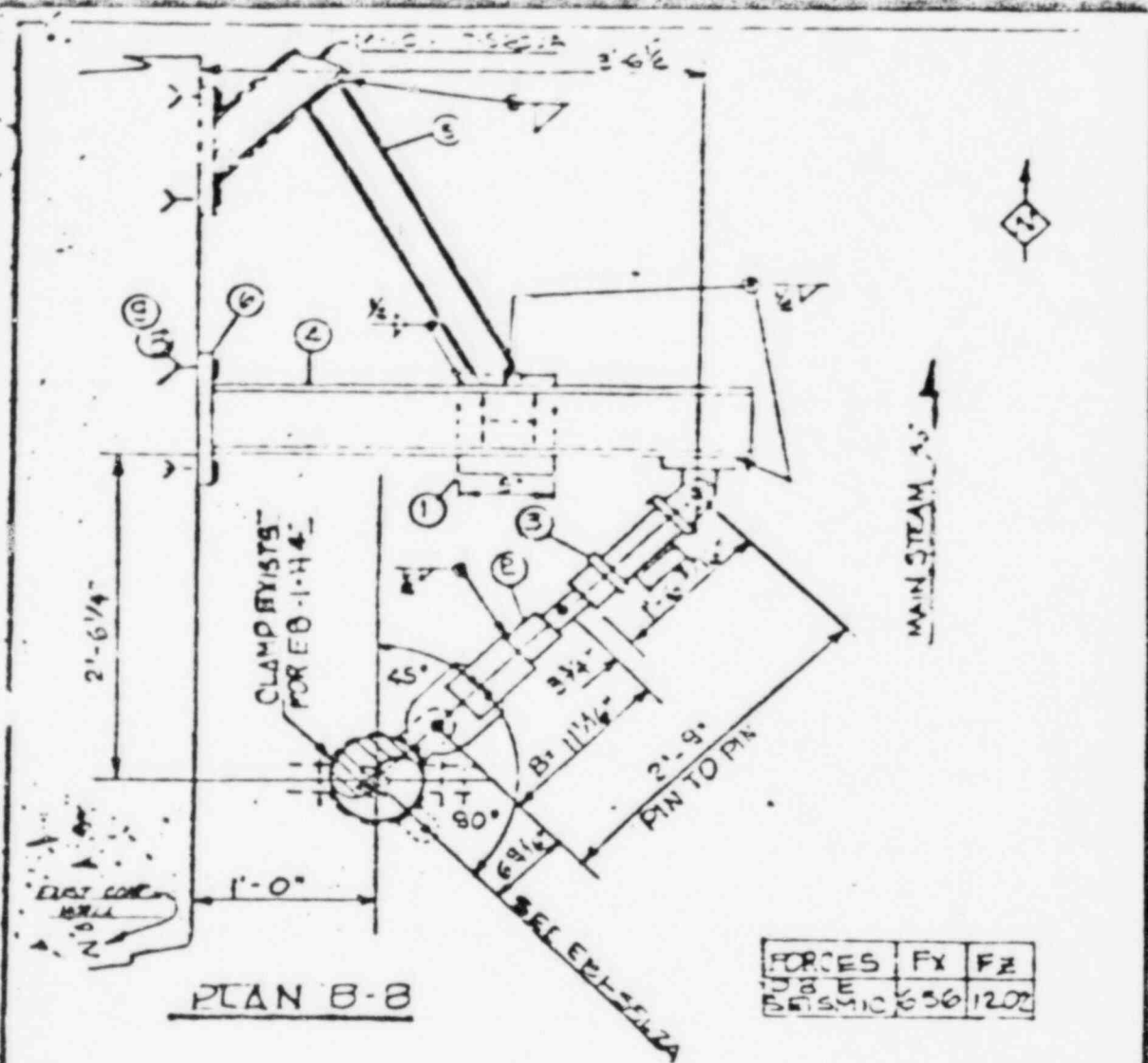
ORIGINATOR: E. [unclear] DATE: 7/22/50
 PROJECT: Palisades Nuclear Plant
 SUBJECT: Anchor, Supporter and Nozzle Loads & Stresses
 CALC NO: 1267-23 REV NO: 0
 CHECKED: C. Y. [unclear] DATE: 7/22/50
 DESIGNED: [unclear]


LOAD NO.	(lbs)	F _x (lbs)	F _y (lbs)	F _z (lbs)	M _x (ft-lbs)	M _y (ft-lbs)	M _z (ft-lbs)	X (in)	Y (in)	Z (in)
1	170	0	106	-176	0	0	0	0	0	0
2	495	0	158	-196	178	0	0	0	0	0
3	50	0	62	-17	0	0	0	0	0	0
4	495	0	158	-196	178	0	0	0	0	0
5	50	0	62	-17	0	0	0	0	0	0
6	495	0	158	-196	178	0	0	0	0	0
7	50	0	62	-17	0	0	0	0	0	0
8	495	0	158	-196	178	0	0	0	0	0
9	50	0	62	-17	0	0	0	0	0	0
10	495	0	158	-196	178	0	0	0	0	0
11	50	0	62	-17	0	0	0	0	0	0
12	495	0	158	-196	178	0	0	0	0	0
13	50	0	62	-17	0	0	0	0	0	0
14	495	0	158	-196	178	0	0	0	0	0
15	50	0	62	-17	0	0	0	0	0	0
16	495	0	158	-196	178	0	0	0	0	0
17	50	0	62	-17	0	0	0	0	0	0
18	495	0	158	-196	178	0	0	0	0	0
19	50	0	62	-17	0	0	0	0	0	0
20	495	0	158	-196	178	0	0	0	0	0
21	50	0	62	-17	0	0	0	0	0	0
22	495	0	158	-196	178	0	0	0	0	0
23	50	0	62	-17	0	0	0	0	0	0
24	495	0	158	-196	178	0	0	0	0	0
25	50	0	62	-17	0	0	0	0	0	0
26	495	0	158	-196	178	0	0	0	0	0
27	50	0	62	-17	0	0	0	0	0	0
28	495	0	158	-196	178	0	0	0	0	0
29	50	0	62	-17	0	0	0	0	0	0
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39	50	0	62	-17	0	0	0	0	0	0
40	495	0	158	-196	178	0	0	0	0	0
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42	495	0	158	-196	178	0	0	0	0	0
43	50	0	62	-17	0	0	0	0	0	0
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45	50	0	62	-17	0	0	0	0	0	0
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95	50	0	62	-17	0	0	0	0	0	0
96	495	0	158	-196	178	0	0	0	0	0
97	50	0	62	-17	0	0	0	0	0	0
98	495	0	158	-196	178	0	0	0	0	0
99	50	0	62	-17	0	0	0	0	0	0
100	495	0	158	-196	178	0	0	0	0	0

*Friction is based on .3 x Deadload Reaction

NO.	DESCRIPTION
1	3/8" x 12' ROD x 1.54' LG
2	VS2A-B VARIABLE SUPPORT XL 550" CL 485" (NOTED LOAD 495)
3	3/8" x WELDED EYEROD x 2' LG TAD 6"

4 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



OF THIS RELOCATED (3)			
ISSUED FOR CONSTRUCTION		RS	
REVISIONS		BY	
PALISADES PLANT	 SAN FRANCISCO	NO M-119	
CONSUMERS POWER COMPANY		REF DWGS	
AUXILIARY BLDG.	JOB NO	DRAWING NO	REV
STEAM TO P-8 TURBINE	12447-033	EB-1-55L2A	2/ OF

12447-033 1T-1 /FP-3 A:

Rev.	Comments	Checked

1. Check
APPY

0808050334

ADD LINE - SERIAL NO. System: LET DOWN LANE Wdg: CONCRETE Area/Zone: 1/CONCRETE

HTap No: H202 Rev: B Ref. Dwg. No: H17 Rev: A 150 CONCRETE Prev. Item No: CC-3 CONCRETE CCS-1-NL

Installation per Detail Dwg. Yes No TYPE Wall
 If no, As-Built Dwg. Complete Yes No Wall

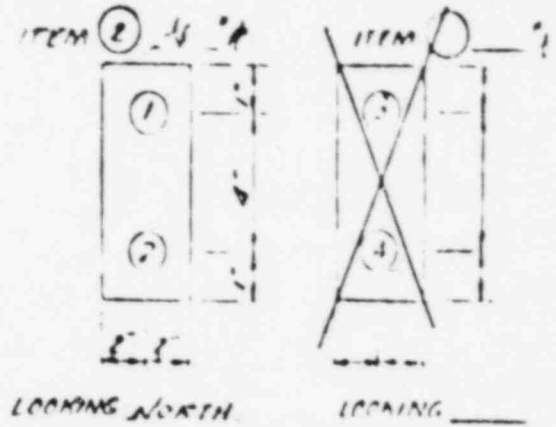
Evidence of Concrete Cracking or Failure Floor
 If yes, show on sketch Yes No Ceiling

No. of Expansion Anchors: 2 Pipe Elevation: 60V-6

Measured gap between concrete surface and back of support plate:

Walkdown Inspector Signature: David S. Taylor Date: 1/10/80
 Reviewer Signature: J. Rucker Date: 1/26/80

CONCRETE EXPANSION ANCHOR



Wedge	Bolt No. (Per Sketch)	J Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Wedge Length	Applied	Page/Drawn	No. of Tens. Applied	Wedge Thread in	Int. Tens. Method	Comments
Shell		K Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Wedge Length				Wedge or Shell Int.	Test Method	
<u>5</u>	<u>1</u>	<u>5</u>		<u>1/2</u>									
<u>2</u>	<u>2</u>	<u>3</u>		<u>1/2</u>									

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____

Discrepancies (Circle) Yes/No Reported to Client: Discrepancies Resolved: None Repair: _____

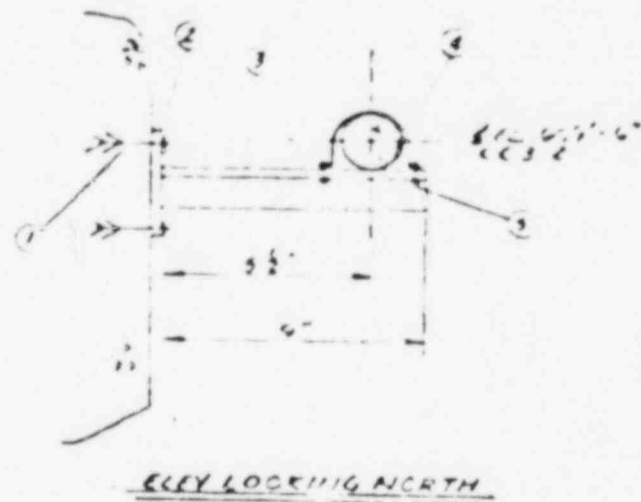
Engineering Evaluation: Acceptable Signature: _____ Date: _____ Discrepancies Resolved: FCR Other: _____

Final Acceptance Signature: _____ Date: _____

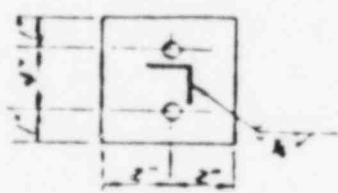
1. Check
APPY

1-2

REV.	DATE	BY	DESCRIPTION
1			2" COMPACT FUSIONERS (CHECK)
2			R 3/4" x 6" (IFC'D)
3			L 2" x 2" x 7' Lg (IFC'D)
4			PIPE STRAP FOR 2" PIPE SIZE (IFC'D)
5			2" x 2" BRACKET w/ NUTS & WASHERS



KEY LOOKING NORTH



DETAIL B
LOOKING WEST

See 150
Location

REV.	DATE	BY	DESCRIPTION
			BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447
REV.	DATE	BY	DESCRIPTION
			CONSUMERS POWER COMPANY PALISADES CONVERT, MICHIGAN
			System: LETDOWN LINE
			Plant Area/Room: 1/CONTAINER BLT
			PLID: M 202
			Instrument: 51 550-CC3-1
			Ref. Dwg: A 17
			Support/Restraint No: CC3-1-H1.1

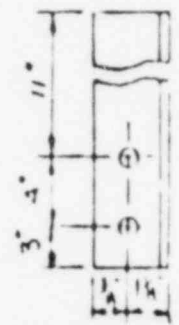
REV.	DATE	BY	DESCRIPTION
1			8" 3-BOLT CLAMP, 6" x 3 1/2", PROVIDES LOCKING MEANS WELDED W/ TWO SPAN-3 LUGS (MATERIAL CS)
2			PISTON ROD CONN W/ B: 1 1/2" x 1/2"
3			HSSA-3, 6" STROKE, 1 1/2" BORE THERMAL MT: 4 (-)

1-3

ADD'L LINE-SERIAL 38, System: LETDOWN LINE Sls: CONTAINMENT Area/Room: 1/CONTAINMENT
 Mfg. No: M 202 Rev: 3 Ref. Dwg. No: M 17 Rev: 10 ISO No: CC-1 Rev: 1 Line No: CC-3-2 Ref. Dwg: CC-3-1-NI.2 Rev: 1

Installation per Detail Dwg. Yes No TYPE Wall
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure Floor Ceiling
 If yes, show on sketch Yes No
 No. of Expansion Anchors: 2 Pipe Elevation: 6'0" - 6"

ITEM (3) 2x2x1/4 L



LOOKING WEST

Measure gap between concrete surface and back of support plate:
 Inspector Signature: [Signature] Date: 1-12-80
 Reviewer Signature: [Signature] Date: 1/26/80

CONCRETE EXPANSION ANCHOR

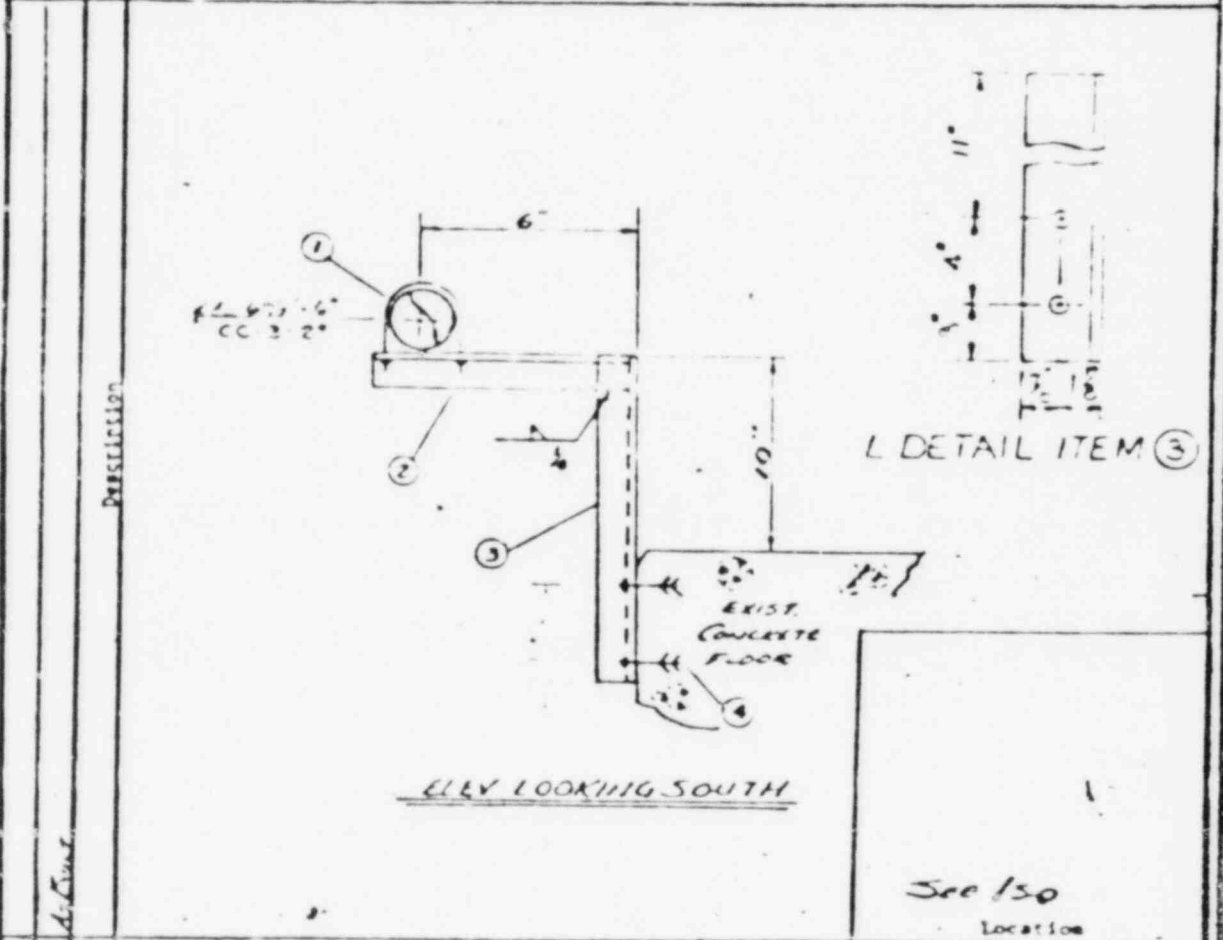
Wedge	Wedge No. (Per Set)	J Wedge	Thread Engag.	Stud Dia.	Stud Project. Length	Stud Length	Embed. Length	Applied	Case/Drawn	No. Pins/Trns. Washer, OK	Inspected Thread (in)	Not Ant-tomed	Comments
Shell	Shell	Thread Engag.	Bolt Dia	Length S to C	Bolt Length	Embed. Length				Plate	Washer or nut (in)	Test Method	
5	1	5		1/2"									
5	2	5		1/2"									

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client: Discrepancies Resolved: Internal Repair: _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached
 Discrepancies Resolved: FCR# Other _____ Final Acceptance Signature: _____ Date: _____

Comments

1082

DATE	01/14	APP'D	
NO.	1	QTY	1 (R30'0)
	2	QTY	1 (R30'0)
	3	QTY	1 (R30'0)
	4	QTY	2 (R30'0)
DESCR	1 STD U-BOLT FOR 2" PIPE		
	2 L2-2 1/2" X 1/8" LG		
	3 L3-2 1/2" X 1/8" LG		
	4 1/2" CONCRETE FASTENERS		
DRAWN			



REV.	DATE	BECHTEL ANN ARBOR, MICHIGAN	System: <u>WATER LINE</u>
		PALISADES PROJECT JOB 12447	Plant Area/Room: <u>1/CONTAINMENT</u>
		CONSUMERS POWER COMPANY PALISADES	PAID: <u>M 202</u>
		COVERT, MICHIGAN	Isometric: <u>ESC-031</u>
			Ref. Dwg: <u>M 17</u>
			Support/Restraint No: <u>CC3-1-N1.2</u>

NO.	1	QTY	
DATE	01/14	APP'D	
NO.	2	QTY	
DATE		APP'D	
NO.	3	QTY	
DATE		APP'D	
NO.	4	QTY	
DATE		APP'D	
NO.	5	QTY	
DATE		APP'D	
NO.	6	QTY	
DATE		APP'D	
NO.	7	QTY	
DATE		APP'D	
NO.	8	QTY	
DATE		APP'D	
NO.	9	QTY	
DATE		APP'D	
NO.	10	QTY	
DATE		APP'D	
NO.	11	QTY	
DATE		APP'D	
NO.	12	QTY	
DATE		APP'D	
NO.	13	QTY	
DATE		APP'D	
NO.	14	QTY	
DATE		APP'D	
NO.	15	QTY	
DATE		APP'D	
NO.	16	QTY	
DATE		APP'D	
NO.	17	QTY	
DATE		APP'D	
NO.	18	QTY	
DATE		APP'D	
NO.	19	QTY	
DATE		APP'D	
NO.	20	QTY	
DATE		APP'D	

1-5

APPROVED

T. WBB
APR 80

1-5

ADD'L LINE-SERIAL # 396 System: LETDOWN LINE Bldg: CONTAINMENT Area/No: 1/CONTAINMENT

WExp No: M202 Revis: 5 Ref. Dwg. No: M17 Rev UD ISO No: CCS-1 Revision Line No: CCS-2 Hgt. Dwg: CCS-1-M17.3 Revis: A

Installation per Detail Dwg. Yes No Type
If no, As-Built Dwg. Complete Yes No Wall

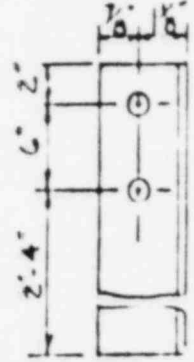
Evidence of Concrete Cracking or Failure Floor
If yes, show on sketch Yes No Ceiling

No. of Expansion Anchors: 2 Pipe Elevation: 46'-4"

Measured gap between concrete surface and back of support plate:

Walkdown Inspector Signature: David S. Taylor Date: 1-12-80
Reviewer Signature: J. Parker Date: 1/26/80

ITEM 1 2" X 2" X 1/4" L

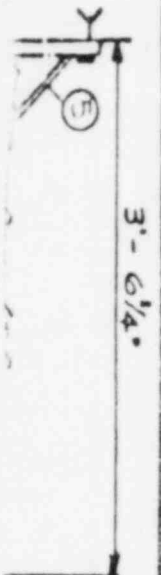


LOOKING WEST

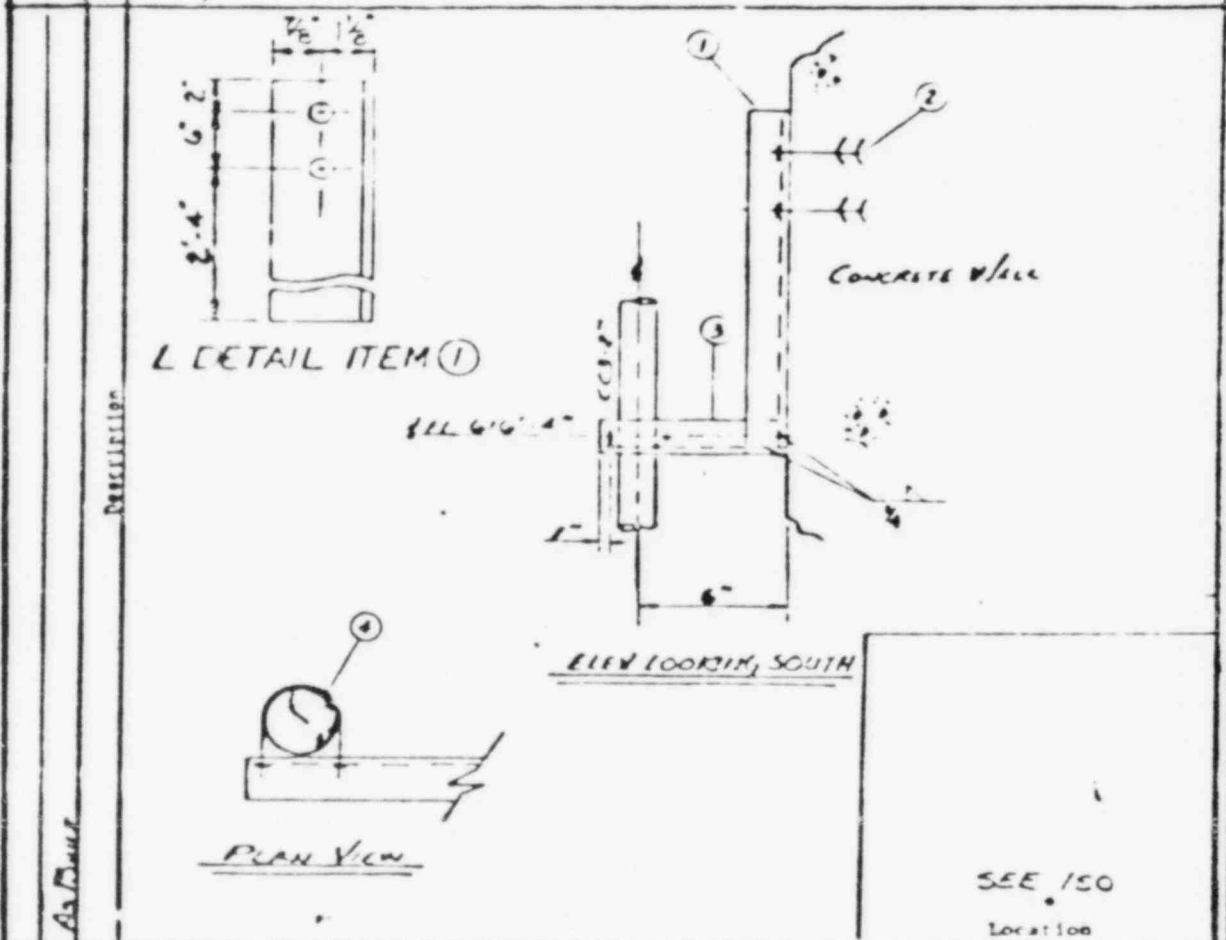
CONCRETE EXPANSION ANCHOR

Wedge	Bolt No. (Per Sketch)	J Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Tabed Length	Applied Epoxy	Case/Drill Hole No.	No. Pins/Trns.	For Wedge-It No. of Plates	Exposed Thread (in)	Not Not-iced	Test Method	Comments
S	1	S		1/2"											
S	2	S		1/2"											

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: Engr. _____ Repair _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached
 Discrepancies Resolved: PCR# _____ Other _____ Final Acceptance Signature: _____ Date: _____



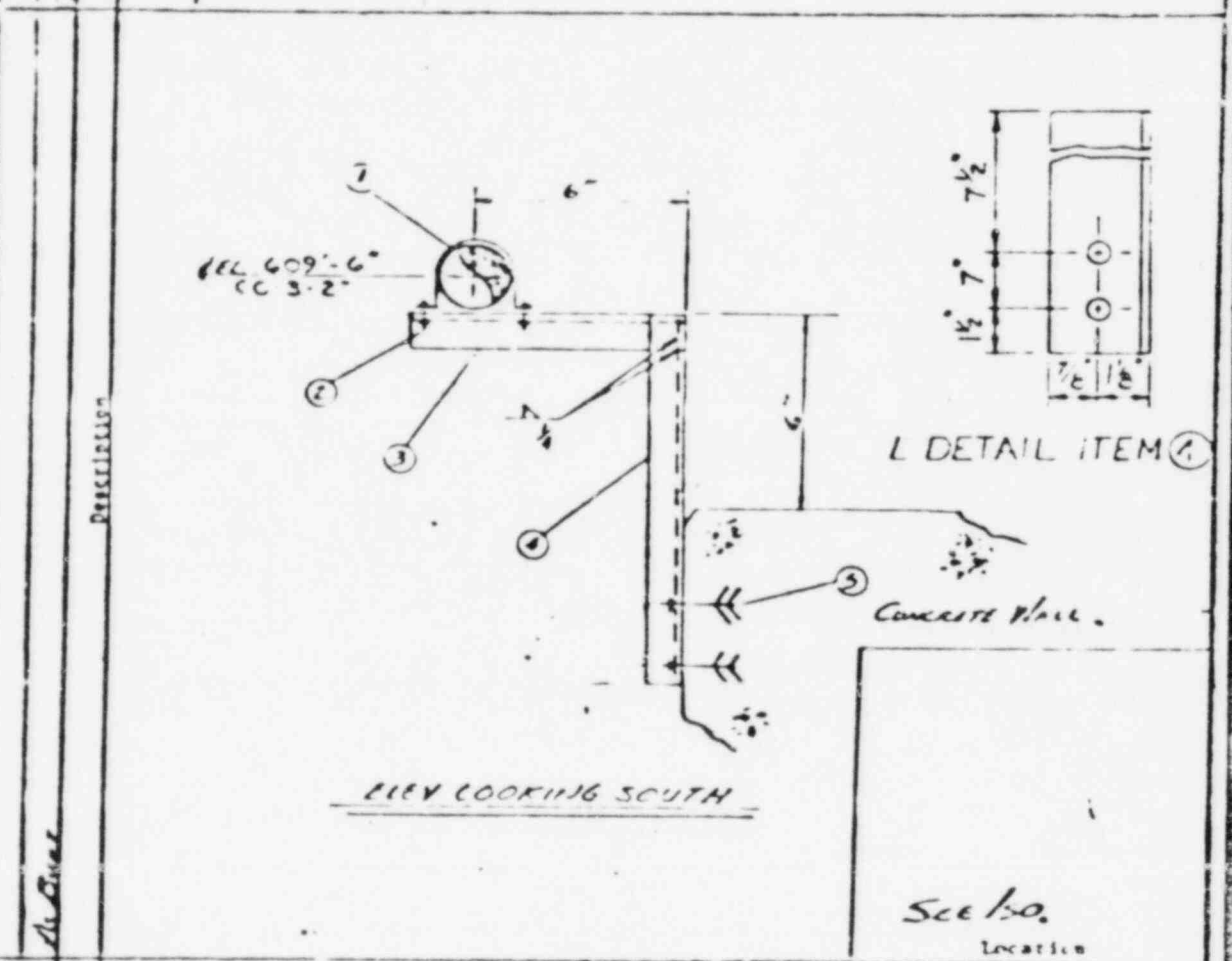
QTY	DESCRIPTION	UNIT
1	2x4x8x13'0" LG	(1 REQ'D)
2	3/4" CONCRETE FINISHERS	(2 REQ'D)
3	2x2x4x10'9 1/2" LG	(1 REQ'D)
4	STD 4" CUT FOR 2" PIPE SIZE	(1 REQ'D)



BECHTEL AND ARNOLD, MICHIGAN PALISADES PROJECT JOB 12447	System: <u>LEAD PIPING LINE</u> Plant Area/Room: <u>1/CONTAINMENT</u> PAID: <u>M 202</u>
CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	Isometric: <u>SP15E CC31</u> Ref. Dwg: <u>M 17</u> Support/Restraint No: <u>CC3-1-H1.3</u>

1	SAFETY	251	23" X 5" X 7" PLATE, PIPING LOCK OUT, PART: C.S. DISTON 200 CONT. H/D. 11/16" LE HSSA-3, 6" SPT. 1/2" BORE THERMAL MVT. = 1/6" (-) COLD POS. DIS. SETTING 53 3/4" (MIDDLE) STD. LOCK OUT PLATE FOR DISTON OR BO. CL.
---	--------	-----	--

QTY	DESCRIPTION	UNIT
1	PIPE SHARP END 2" DIA SIZE	(1 REQ'D)
2	4" B END 3" DIA	(2 REQ'D)
2	L 2" x 2" x 1/4" x 6' 0" LG	(2 REQ'D)
4	L 2" x 2" x 1/4" x 4' 6" LG	(4 REQ'D)
5	8" CONCRETE FASTENERS	(5 REQ'D)

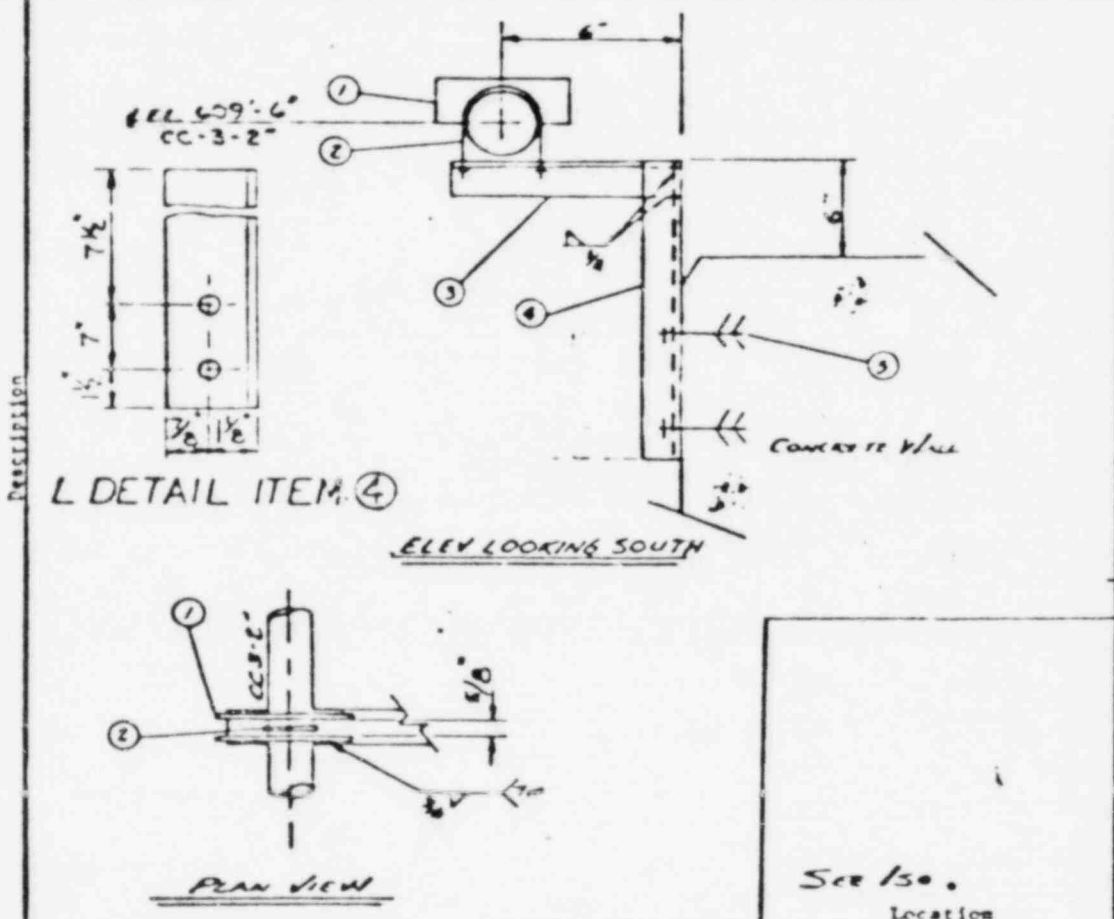


REV	DATE	DESCRIPTION	LOCATION
1-C		BECHTEL ANS ARBOR, MICHIGAN PALISADES PROJECT JOB 17447	System: LEADDOWN LINE Plant Area/Line: 1/CONTAINMENT PID: M 232
1-C		CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	Isometric: SPFSK-003-1 Ref. Dwg: M17 Support/Restraint No: 003-1-H1-A

NO.	DATE	BY	CHKD	DESCRIPTION
1				
2				
3				
4				
5				

1-9

NO.	QTY	DESCRIPTION
1	2	1/2" DIA. U-BOLT
2	1	5/8" U-BOLT FOR 2" PIPE SIZE
3	1	1/2" DIA. 4" x 0.8" LG.
4	1	1/2" DIA. 4" x 1.4" LG.
5	2	2" CONCRETE FASTENERS



BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	System: <u>LEADPIPE LINE</u> Plant Area/Room: <u>1/CONTAINMENT</u> P&ID: <u>M 202</u> Isometric: <u>SK FSK. CC 3-1</u> Ref. Dwg: <u>M 17</u> Support/Restraint No: <u>CC 3-1-HI.5</u>
CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	

NO.	QTY	DESCRIPTION
9	4	1/2" DIA. CONCRETE FASTENER (4 REQ'D)
10	1	1" DIA. THREADED ROD 1'-2" LG.
11	2	1/2" DIA. U-BOLT (NOTED LOAD N/A, NOTED TRAVEL N/A) (2) REQ'D
12	1	1/2" DIA. 4" x 2" x 1/2" x 2'-0" LG. (1) REQ'D

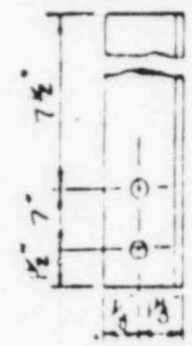
T. CWT				
Item	Appr			
1	R	2" x 3" x 15"		
2	R	8" x 4" x 10"		
3		SIZE B WELDING CLIPS AT JOIN		
4		1" x 4" x 12" WELD MIT		
QTY				
1				
1				
2				

ADD'L LINE - SERIAL # 996 System: LATDOWN LINE. Wdg: CONTAINMENT Area/Room: 1/CONTAINMENT
 Prop No: M202 Revis: 3 Ref. Dwg. No: M17 Revis: 10 ISO No: CCS-1-741 Revis: Line No: CCS-1-11.6 Revis: 1

Installation per Detail Dwg. Yes No Type _____
 If no, As-Built Dwg. Complete Yes No Wall
 Evidence of Concrete Cracking or Failure Floor
 If yes, show on sketch Yes No Ceiling
 No. of Expansion Anchors: 2 Pipe Elevation: 609'-6"
 Measured gap between concrete surface and back of support plate:

Walkdown Inspector Signature: David S. Taylor Date: 1-12-80
 Reviewer Signature: J. Rucker Date: 1/26/80

ITEM ④ 2" x 2" x 1/4" L



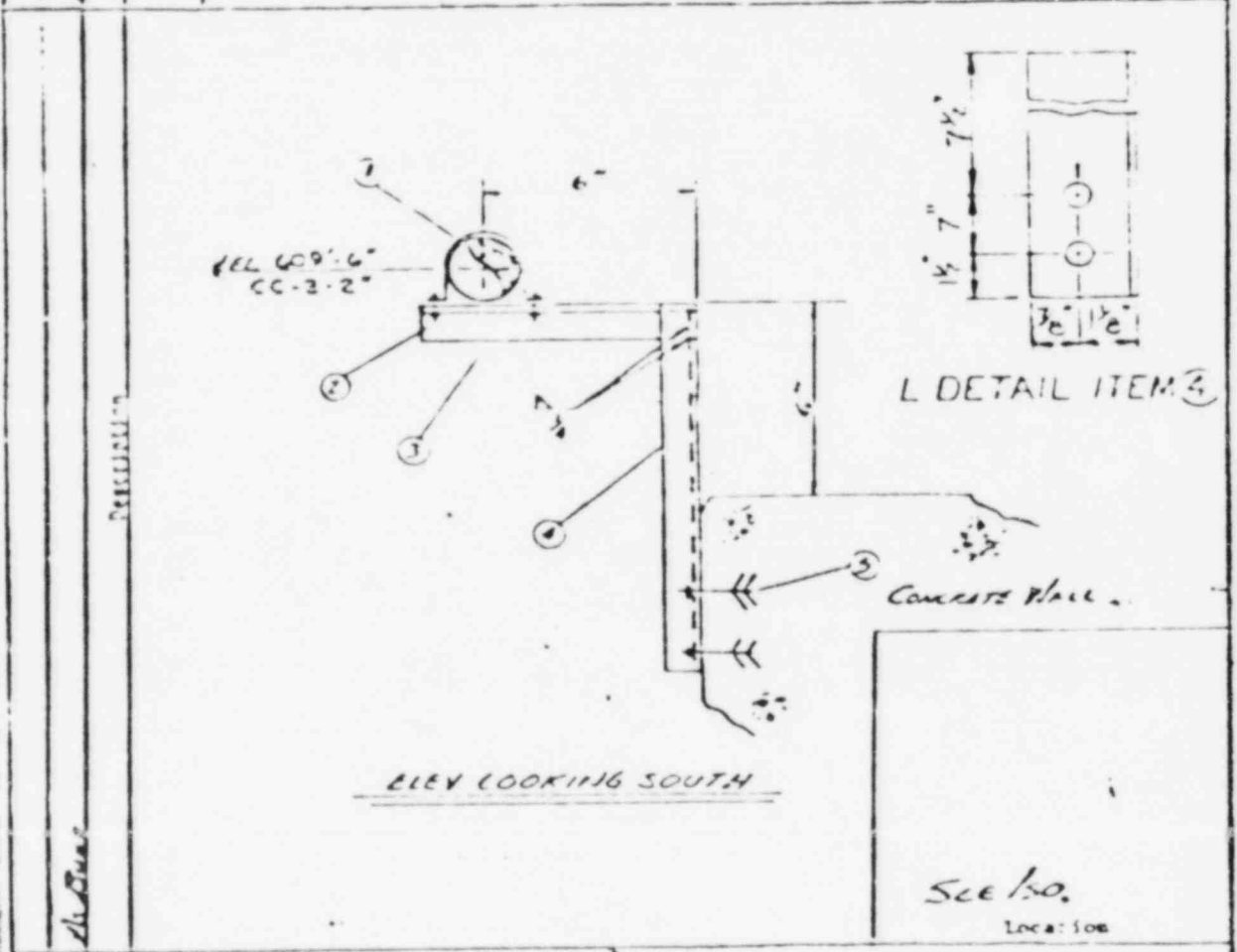
LOOKING WEST

CONCRETE EXPANSION ANCHOR													
Wedge	Bolt No. (Per Sketch)	J Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Applied Tor./Fm.	Cage/Anchor Ident No.	No. Trns. for Wej-It Pins/Washer, OK	Exposed Thread (in)	Not-Toned	Comments
Shell	Bolt No. (Per Sketch)	S Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length			No. Trns. of Plate	Exposed Thread (in)	Test Title or Method	Tested
				1/2"									
				1/2"									

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____
 Unacceptable, Description Attached

15-1-033 87-1-11.6

QTY	PK	COND	DESCRIPTION	UNIT
1			REINFORCING 2" DIA 5'0"	(12.00)
2			1/2" DIA 5'0" W/ 1/2"	(12.00)
3			L 2" X 2" 1/2" X 1'0" CC	(12.00)
4			L 2" X 2" 1/2" X 1'0" CC	(12.00)
5			1/2" CONCRETE FASTENERS	(12.00)



RECIPIENT ANX ARNOR, MICHIGAN PALISADES PROJECT JOB 12447	SYSTEM: <u>LED DOWN LIGHT</u> PLANT AREA/FLOOR: <u>1/CONFERENCE</u> P&ID: <u>M 202</u> ISOMETRIC: <u>SPRINK-CC3-1</u> Ref. Eng: <u>MIF</u> Support/Restraint No: <u>CC3-1-H1-6</u>
CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	

REV	DATE	BY	CHKD	COMMENTS
1				
2				

1-13

1-13

ADPL LINE-SERIAL 394 System: LETDOWN LINE Bldg: CONFINEMENT Area/Room: 1/CONFINEMENT
Exp No: M202 Rev: 3 Ref. Dwg. No: M17 Rev: 10 ISO No: CC3-1 Rev: CC3-2 Part No: CC3-1-N17 Rev: 1

Installation per Detail Dwg. Yes No TYPE Wall
If no, As-Built Dwg. Complete Yes No

Evidence of Concrete Cracking or Failure Floor
If yes, show on sketch Yes No Ceiling

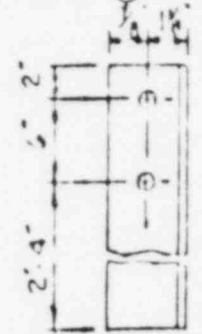
No. of Expansion Anchors: 2 & Pipe Elevation: 6'6"-2"

Measured gap between concrete surface and back of support plate:

Walkdown Inspection Signature: David Taylor Date: 1-12-90

Reviewer Signature: J. Packer Date: 1/26/90

ITEM ① 2" X 2" X 1/4" L



LOOKING WEST

CONCRETE EXPANSION ANCHOR

Wedge	Bolt No. (Per Sketch)	J Wedge	Thread Engage.	Stud Dia.	Stud Project. Length	Stud Embed. Length	Applied Tension	Class/Strength	For Wedge-It Tens. Washer, OK	Exposed Thread (in)	Sub Not-tomed	Comments
Shell	5	Shell	Thread Engage.	Bolt Size	Length S to C	Bolt Embed. Length			No. of Spacing Tens. Washers of Plate	Weld or Intertel Hole for	Test Method	
5	1	5		1/2"								
5	2	5		1/2"								

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____

Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved Internally Repair: _____

Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached

Discrepancies Resolved: PNR Other _____ Final Acceptance Signature: _____ Date: _____

Comments
1-13
1-14
1-15
1-16
1-17
1-18
1-19
1-20
1-21
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1-100

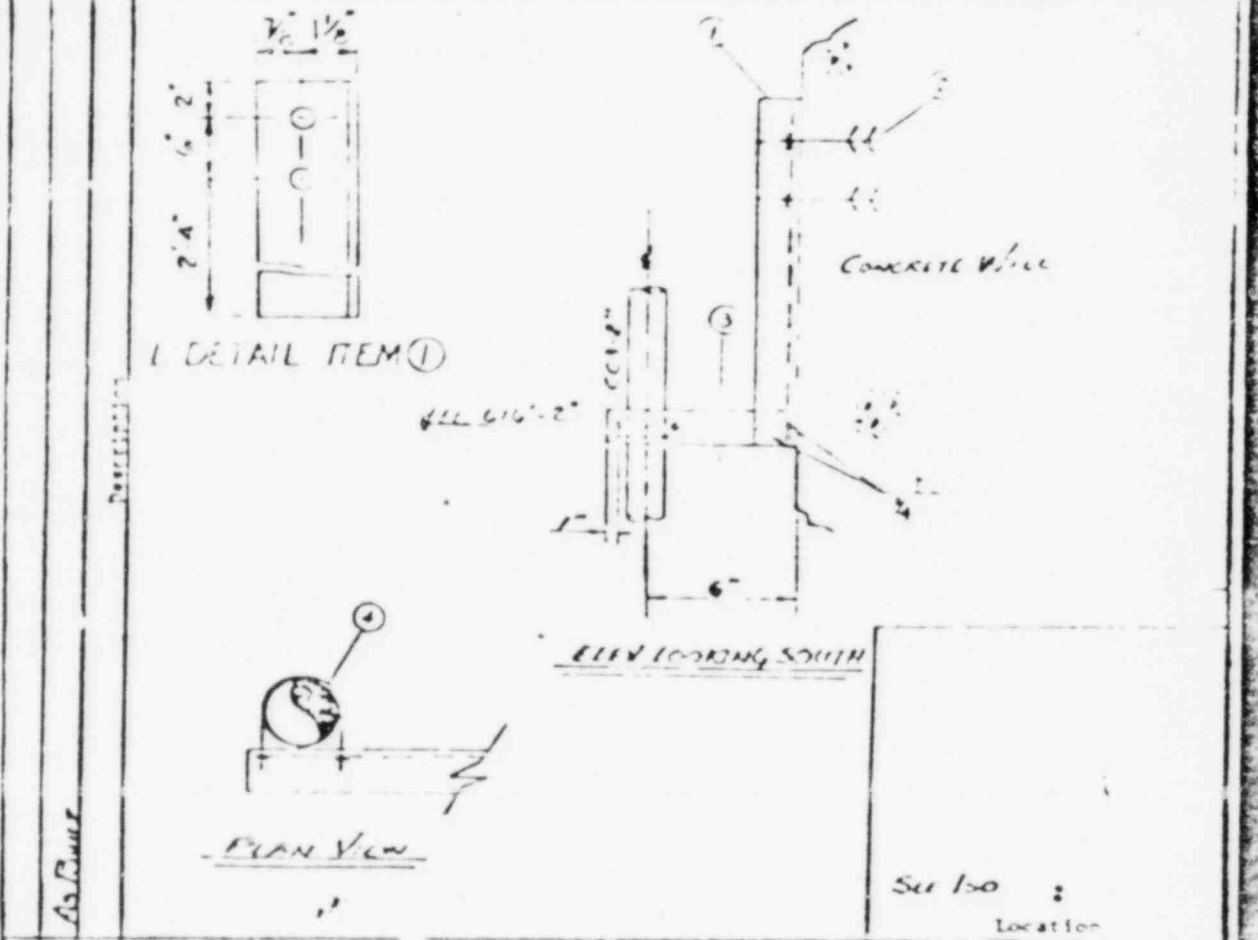
Detail

Final Acceptance (positive)

Other

Discrepancies Resolved: Yes

Item	QTY	DESCRIPTION	UNIT
1	1	4" (3" x 1/4") STD TWO BOLT PIPE CLASD	(18" x 24")
2	1	2" STD WGT PIPE STANCHION X 6'-3 1/16 LG	(24" x 24")
3	1	3/8" x 4" x 4" C.S. PLATE	(18" x 24")
4	1	WSP #7 VARIABLE SUPPORT TYPE 'F'	(18" x 24")



BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	System: <u>LETDOWN LINE</u> Plant Area/Room: <u>1/COMMITMENT</u> PAID: <u>M202</u> Isometric: <u>SPDK CC31</u> Ref. Dwg: <u>M17</u> Support/Restraint No: <u>CC-1-H1.7</u>
CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	

Item	QTY	DESCRIPTION
1	1	SP175 4" (3" x 1/4") STD TWO BOLT PIPE CLASD
2	1	2" STD WGT PIPE STANCHION X 6'-3 1/16 LG (MATERIAL: C.S.)
3	1	3/8" x 4" x 4" C.S. PLATE
4	1	WSP #7 VARIABLE SUPPORT TYPE 'F'

1-15

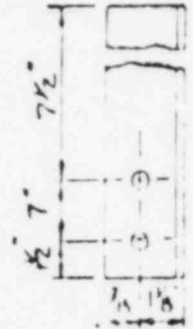
APP'L LINE-SERIAL: 370 System: LTDOWN LINE Sigs: CONTAINMENT Area/Room: 1/CONTAINMENT
 Map No: M202 Rev: 3 Ref. Dwg. No: M17 Rev: 10 ISO No: CC3 Rev. of Line No: CC3-P Ugr. Dwg: CC3-1-H1.B Rev: 10

Installation per Detail Dwg. Yes No TYPE _____
 If no, As-Built Dwg. Complete Yes No Wall
 Evidence of Concrete Cracking or Failure _____ Floor _____
 If yes, show on sketch Yes No Celline _____
 No. of Expansion Anchors: 2 C Pipe Elevation: 609'-6"

Measured gap between concrete surface and back of support plate: _____

Walkdown Inspector Signature: David L Taylor Date: 1-2-80
 Reviewer Signature: J. Kuster Date: 1/26/80

ITEM (A) 2"x2"x1/4" L



LOOKING WEST

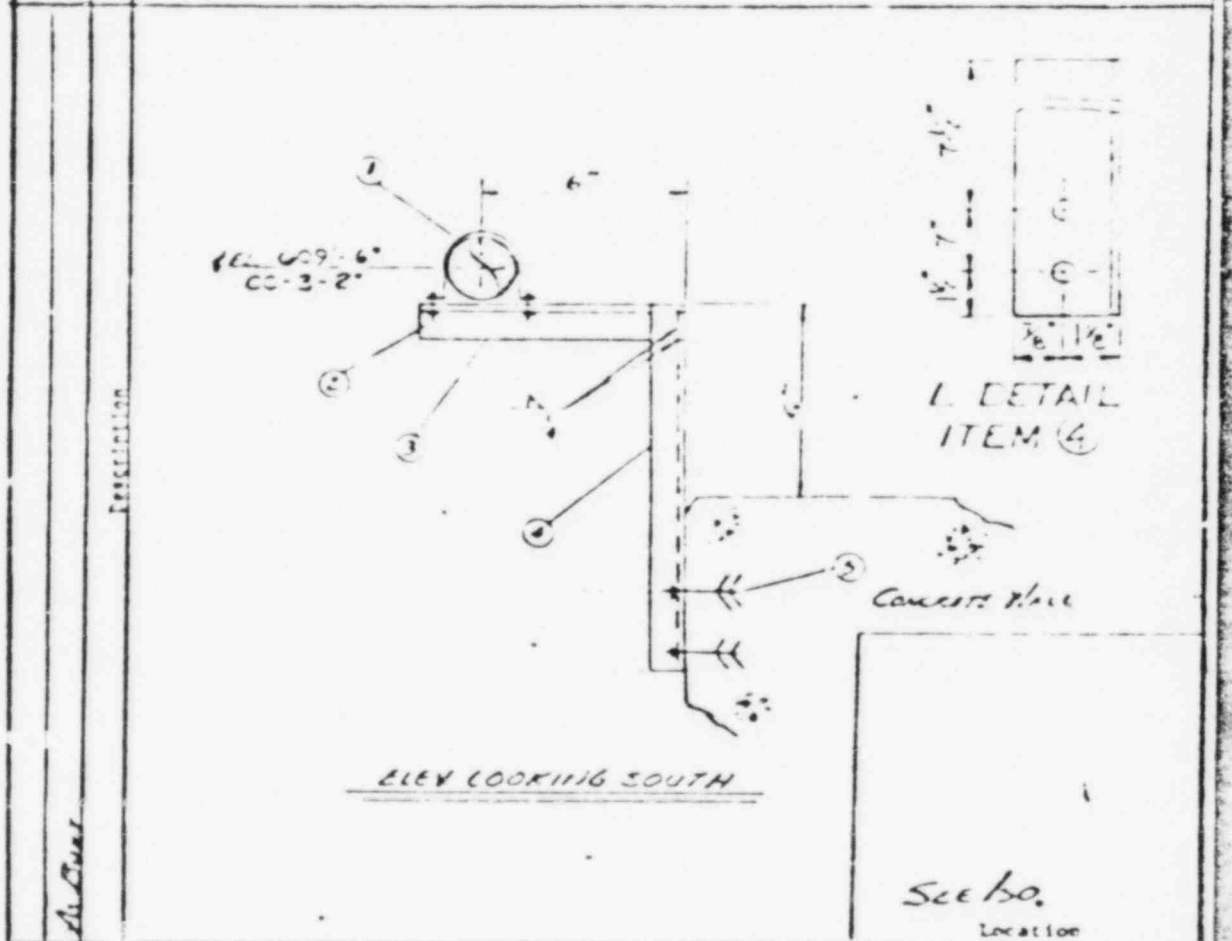
Wedge	No. of Wedges	J Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Pins Length	Case/Trench	No. Pins/Tens. Washers	Exposed Thread (in)	Not-Exposed	Comments
S	2	S		1/2"								
S	2	S		1/2"								

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client: Discrepancies Resolved: _____ Repair: _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable Description Attached: _____

Comments
 1-15 (10-21-80)
 1-16

1-16
 1-16

NO.	DESCRIPTION	QTY	UNIT
1	2" x 2" x 1/2" Flat Bar	(12) @ 2'	LINEAL FT
2	1/2" x 1/2" x 1/2" Flat Bar	(12) @ 2'	LINEAL FT
3	L 2" x 2" x 1/4" x 6'-0" L	(12) @ 2'	LINEAL FT
4	L 2" x 2" x 1/4" x 4'-6"	(12) @ 2'	LINEAL FT
5	1/2" CONCRETE FASTENERS	(12) @ 2'	LINEAL FT



BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	SYSTEM: <u>LETDOWN LINE</u> PLANT AREA: <u>1/10000000</u> P&ID: <u>A1202</u> ISOMETRIC: <u>SP-130-CC3-1</u> REF. Dwg: <u>M17</u> Support/Restraint No: <u>CC3-1-H1.8</u>
CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	

NO.	QTY	DESCRIPTION	UNIT
1	1	R3 #5	CONCRETE REINFORCING
2	1	W40 #7	CONCRETE REINFORCING
3	2	5/8"	CONCRETE REINFORCING
4	1	100	CONCRETE REINFORCING

System: LEAD LINE WELDING: WELDING AREA: ROOM 1000 W/CONTAINMENT

Stress Prob: SN 396 No. of Stud: 17 Date: 11/19/80

Installation per Detail Des. Yes No

If no, As-Built Des. Complete Yes No

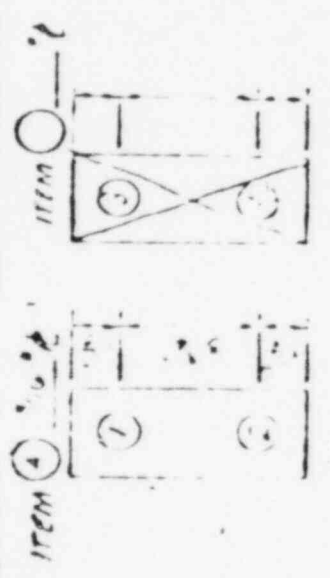
Evidence of Concrete Cracking or Failure Yes No

No. of Expansion Anchors: 2 Pipe Elevations: Good

Measured gap between concrete surface and back of support plate:

Validator Inspector: David L. Lundy Date: 1-12-80

Signature: J. Rankin Date: 1/20/80



Wedge	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Wedge	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Shell	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Wedge																	
Shell																	

UT Inspector Signature: _____ Date: _____

Discrepancies (Circle) Yes No Referred to Client

Engineering Evaluation: Acceptable Signature: _____ Date: _____

Discrepancies Resolved: Final Acceptance Signature: _____ Date: _____

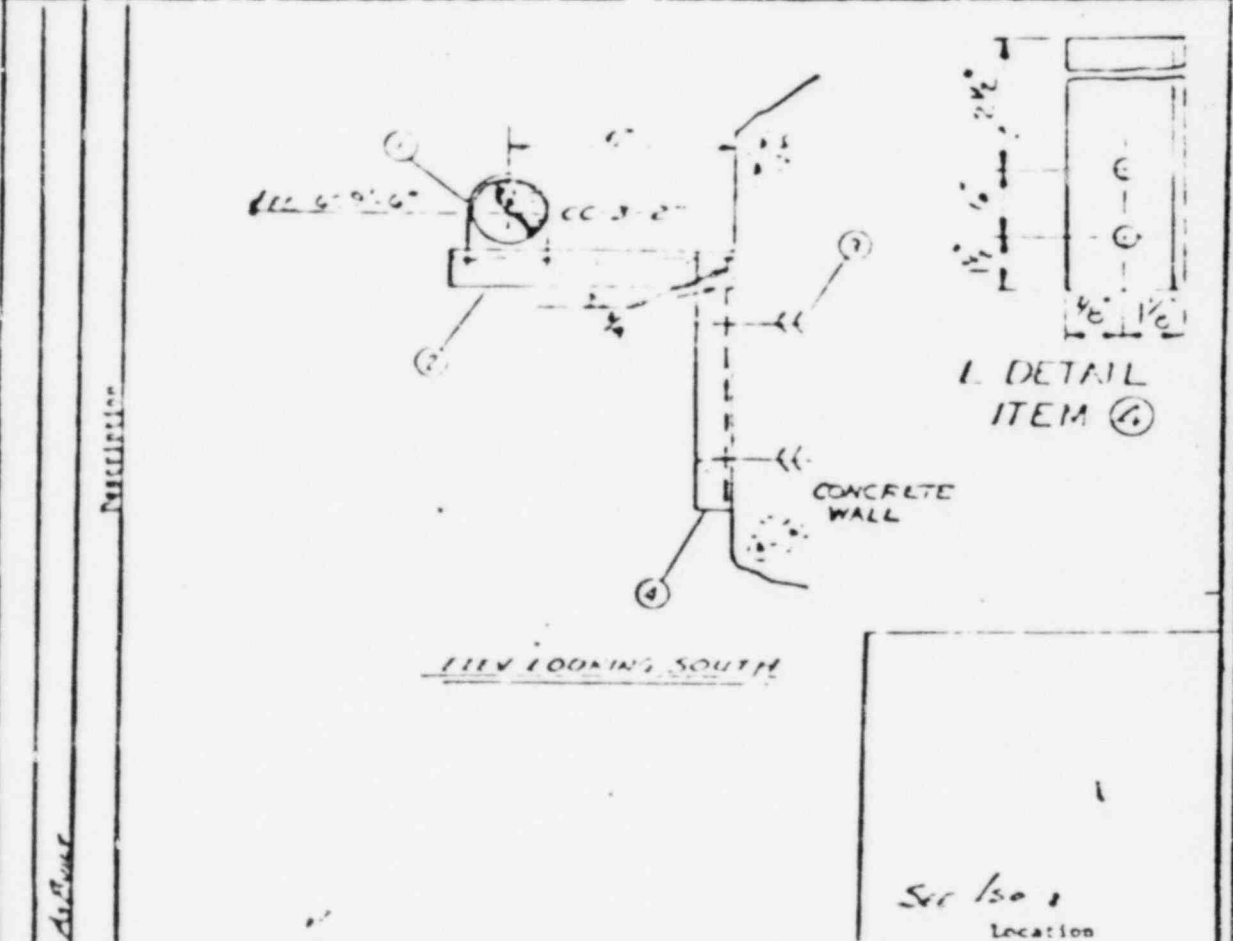
NO.	NAME	SIGNATURE	DATE
1	...	...	...
2	...	...	...
3	...	...	...
4	...	...	...
5	...	...	...

L.C. INCO	DATE	11/21/72
	BY	...
AS BUILT	DATE	11/21/72
	BY	...
<p>1 5/8" STRAP FOR 2" O.D. PIPE</p> <p>2 1/4" BOLT W/ WASHER & NUT (2 BOLT)</p> <p>3 L 2" x 2" x 1/4" ANGLE</p> <p>4 2 3/4" x 1 1/2" x 1/2"</p> <p>5 1/2" O.D. CONC FASTENER (2 BOLT)</p>		
<p>ELEV. LOOKING SOUTH</p>		
<p>SEE 150'</p>		
<p>BECHTEL ANN ARBOR, MICHIGAN</p> <p>CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN</p>		
<p>SPRING LETDOWN LINE PISTON ROD CONNECTION 1/4" CONTAINMENT PART. NO. 202 INSTRUMENT SP-ESK-1003-1 REF. IN: M-17 SUPPORT/FASTENER NO. C13-1-H1.9</p>		

1	1	SP-ESK-1003-1	4"	P.P.E. ATTACHMENT (MATERIALS)
2	1	-	-	PISTON ROD CONNECTION "B" 3-5/8"
3	1	251	MCSA-S	5" STROKE 1 1/2" BORE

TYPE NO.	REVISION	DATE	BY	DESCRIPTION
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			
ASSEMBLY	1			

QTY	DESCRIPTION	UNIT
1	50' U-BOLT 1/2" P. X S. 1	(1000)
2	L 2" X 1/2" X 10' 0" LG	(1000)
3	3/8" CONCRETE FASTENERS	(1000)
4	L 2" X 1/2" X 10' 10" LG	(1000)

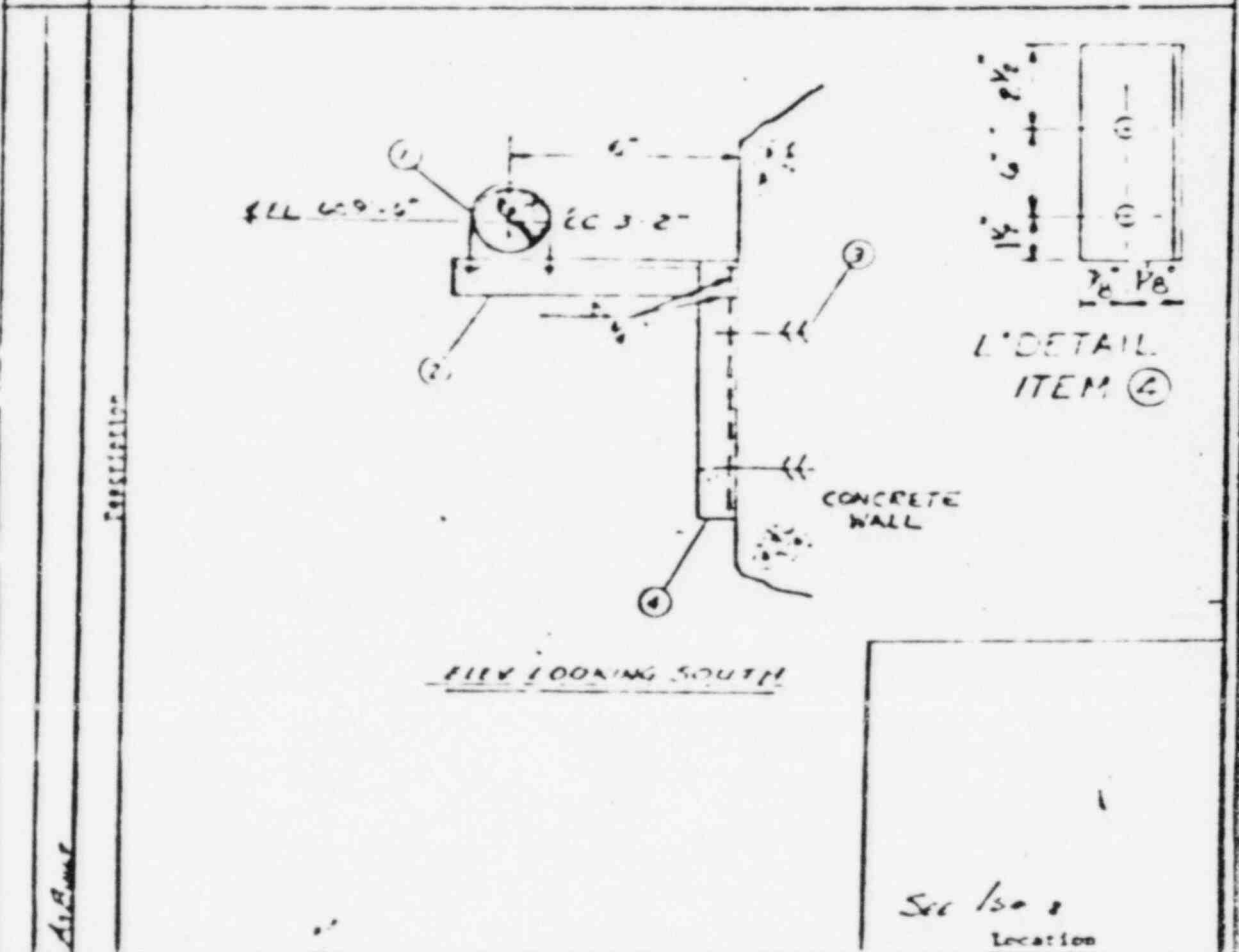


REV	DATE	DESCRIPTION	SYSTEM
ASSEMBLY	10/12/82	BEUTEL AN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	LEADDOWN LINE
ASSEMBLY		CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	Plant Area/Room: 1/CONTAINMENT PAID: M/202 Isometric: SP.FSC-CC-3-1 Ref. Dwg: M-17 Support/Restraint No: CC-3-1-N/10

REV	DATE	DESCRIPTION
ASSEMBLY	1	RSSA-3 STRUT ASSEMBLY
ASSEMBLY	1	W4X13 BEAM X 0' 11" LG
ASSEMBLY	1	CONCRETE 3/8" DIA END ATTACHMENT W/ LOCKNUTS

APP. NO.	NAME	SIGNATURE	DATE
DESIGNED BY			
CHECKED BY	S. J. [unclear]	[unclear]	11-12-19
APPROVED BY	A. [unclear]	BY T. [unclear]	11-12-19

QTY	DESCRIPTION	UNIT
1	50 U-Bolt For 2" Dia. Pipe	(112120)
2	L 2" x 2" x 1/4" O.C. 1/4"	(112120)
3	3" Concrete Fasteners	(112120)
4	L 2" x 2" x 1/4" O.C. 1/4"	(112120)



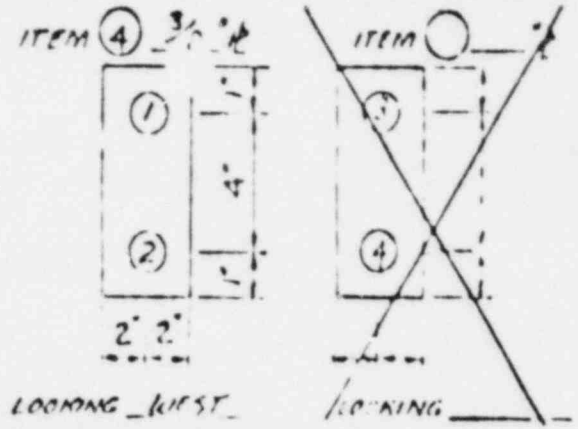
REV. NO.	REVISION	SYSTEM: LEADDOWN LINE
	PLAN: AREA/ROOM: 1/CONTINENT	PAID: M 202
DATE	CONSUMERS POWER COMPANY PALISADES CONVERT, MICHIGAN	ISOMETRIC: SP. FSK. CC-31
		REF. Dwg: M17
		SUPPORT/RESTRAINT NO. CC-3-1-6/11

REV. NO.	QTY	DESCRIPTION
1	2	W4X13 BEAM X 1-11/2" LG
2	2	W4X13 BEAM X 1-0" LG
3	1	175 4-1/2" STD. TWO FOOT PIPE CLAMP 4000000000

ADDL LINE SERIAL 396 System: LETDOWN LINE Wld: CONCRETE Area/Room: 1/CONTINUUM
 M Exp No: M202 Revis: 3 Ref. Dwg. No: M17 Rev: 10 ISO No: CC-1 Rev: AD Line No: CC-2 Ref. Dwg: CC-3-F.H.P., rev: AD

Installation per Detail Dwg. Yes No TYPE
 If no, As-built Dwg. Complete Yes No Wall
 Evidence of Concrete Cracking or Failure Floor
 If yes, show on sketch Yes No Ceiling
 No. of Expansion Anchors: 2 Pipe Elevation: 609'-6"

Measured gap between concrete surface and back of support plate:
 Walkdown Inspection Signature: David S. Taylor Date: 1-12-80
 Reviewer Signature: J. Rucker Date: 1/26/80



CONCRETE EXPANSION ANCHOR

Wedge	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Wedge Dia.	Wedge Length	Wedge Embed. Length	No. of Studs	Final Test Result	Thread (in)	Not-Tested	Comments
3/8"	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	3/8"	1/2"	1/2"	2	OK	3/8"		
3/8"	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	3/8"	1/2"	1/2"	2	OK	3/8"		

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) vs/No Reported to Client Discrepancies Resolved: INTERNAL APPLIC
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached
 Discrepancies Resolved: FCR# Other _____ Final Acceptance Signature: _____ Date: _____

Vertical strip of text on the right margin, likely a revision or tracking log, containing handwritten notes and dates.

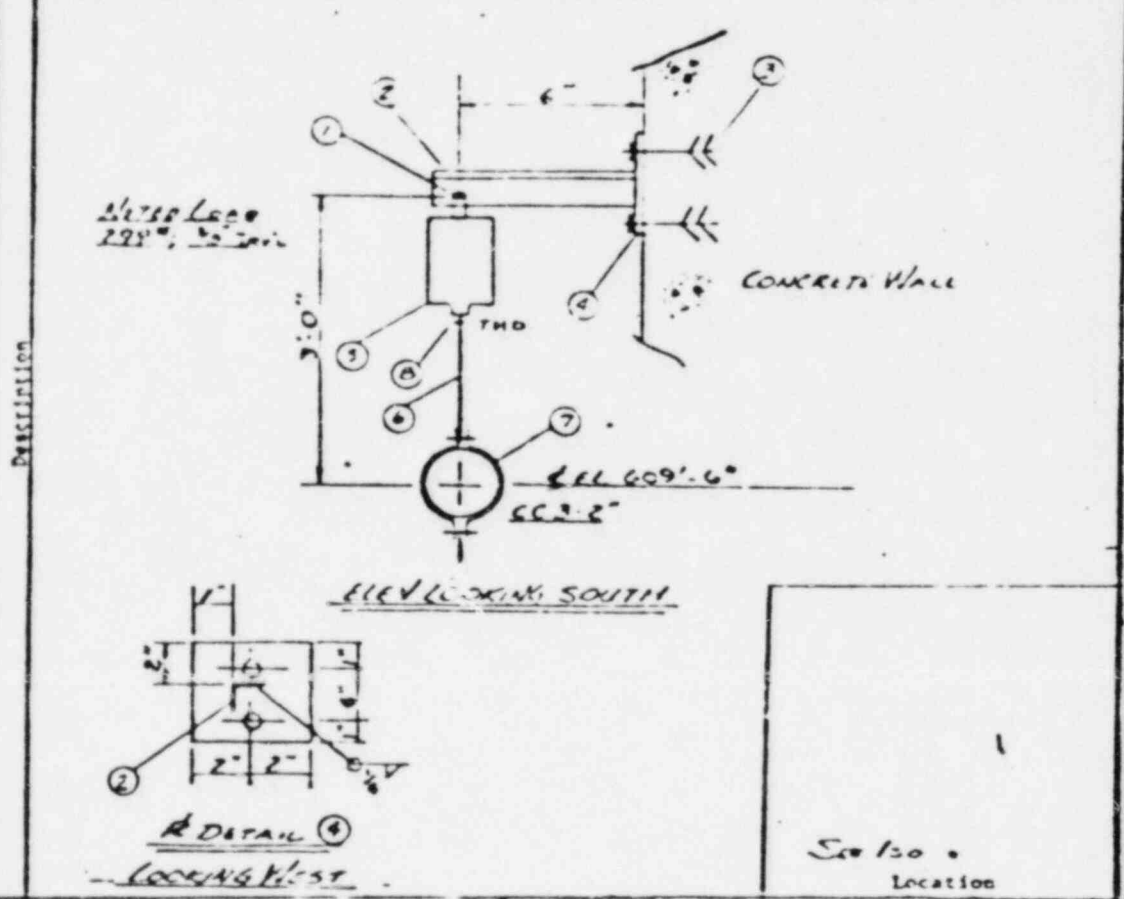
Vertical strip of text on the left margin, possibly a checklist or additional notes.

M/S
 Rev 1

124					
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NO.	NAME	SIGNATURE	DATE
DESIGNED BY	E. Edine	[Signature]	7/1/12
CHECKED BY	A. T. Jones	[Signature]	7/22/12

NO.	DESCRIPTION	QTY	REMARKS
1	1/2" F 516 W/NUT	(1 REQ'D)	
2	LL 2" X 1/2" X 9'-7" LG	(1 REQ'D)	
3	3/8" CONCRETE FASTENERS	(2 REQ'D)	
4	R 2" X 1/2" X 6"	(1 REQ'D)	
5	SPRING CAN NOTED LOAD 1200#, TRF. S. 1/2"	(1 REQ'D)	
6	3/8" THD ENCL. ROD 2" X 6" THD 6"	(1 REQ'D)	
7	3 HOLE ENCL. CLAMP FOR 2" SILL PIPE	(1 REQ'D)	
8	1/2" X 1/2" X 6"		

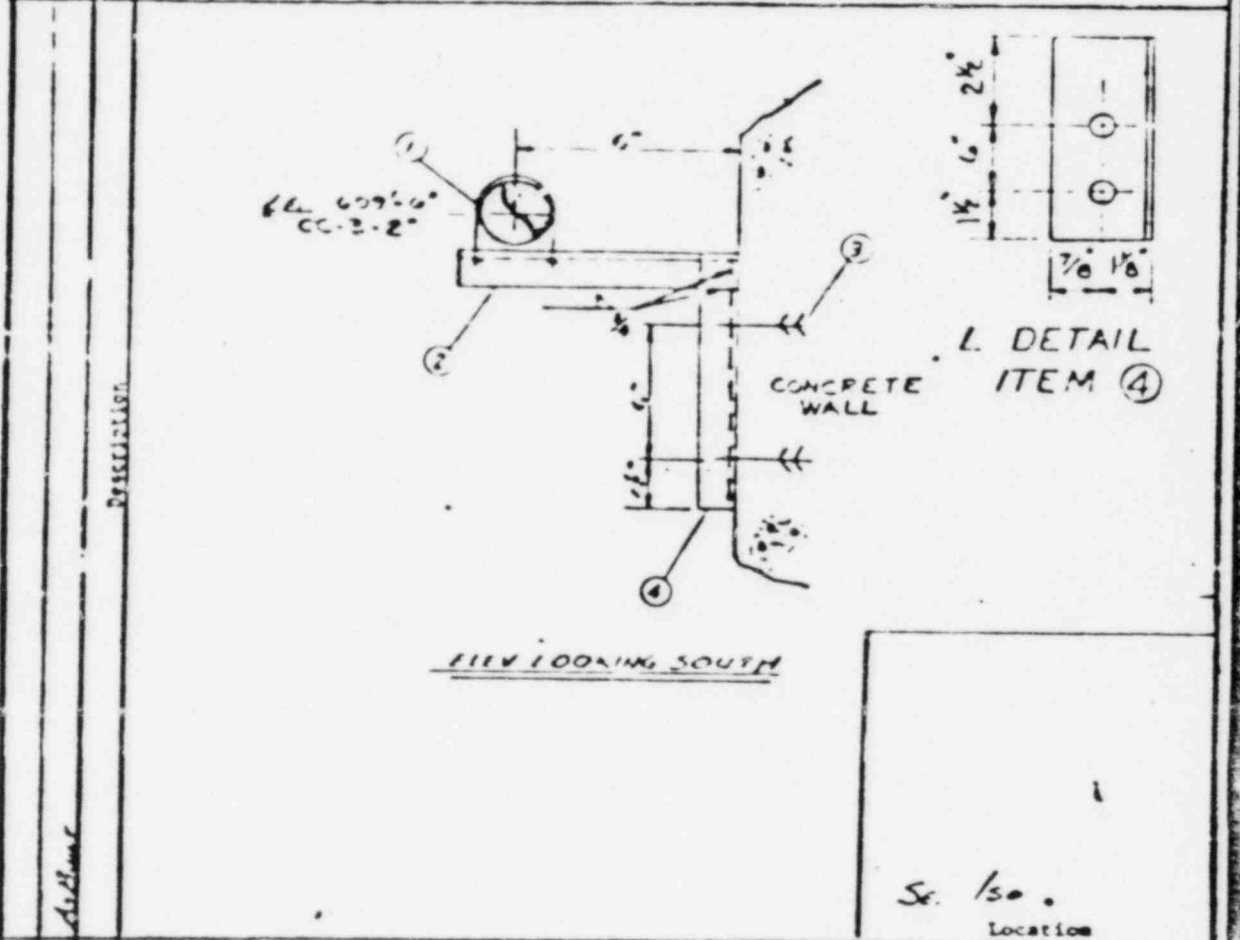


REV.	DATE	DESCRIPTION	SYSTEM: <u>LEAD PIPING LINE</u>
		BECHTEL ANN ARBOR, MICHIGAN	PLANT AREA/ROOM: <u>1/CONTAINMENT</u>
		PALISADES PROJECT JOB 12447	PAID: <u>M 202</u>
		CONSOLIDATED POWER COMPANY PALISADES	ISOMETRIC: <u>C.P. PSK-CC-3-1</u>
		COVERT, MICHIGAN	REF. Dwg: <u>M17</u>
			SUPPORT/RESTRAINT NO: <u>CC-3-1-M.12</u>

NO.	QTY	DESCRIPTION
1	1	175 4" (3" X 1/4") STD. TWO BOLT PIPE CLAMP
2	1	2" STD WGT PIPE STANCHION X 9'-3 1/2" LG (MATL - C.S)
3	1	2" X 1/2" X 6" C.S PIPE

 THERMAL	 DEADLOAD	 WIND	 SEISMIC	 FRICTION	 HYDRO
-------------	--------------	----------	-------------	--------------	-----------

QTY	DESCRIPTION	UNIT
1	SID U Bolt For 2" Pipe Size	(18150)
2	L 2x2x 1/2 @ 0-8 1/2 LG	(18150)
3	3/8" CONCRETE FASTENERS	(28100)
4	L 2x2x 1/2 @ 0-10 LG	(18120)



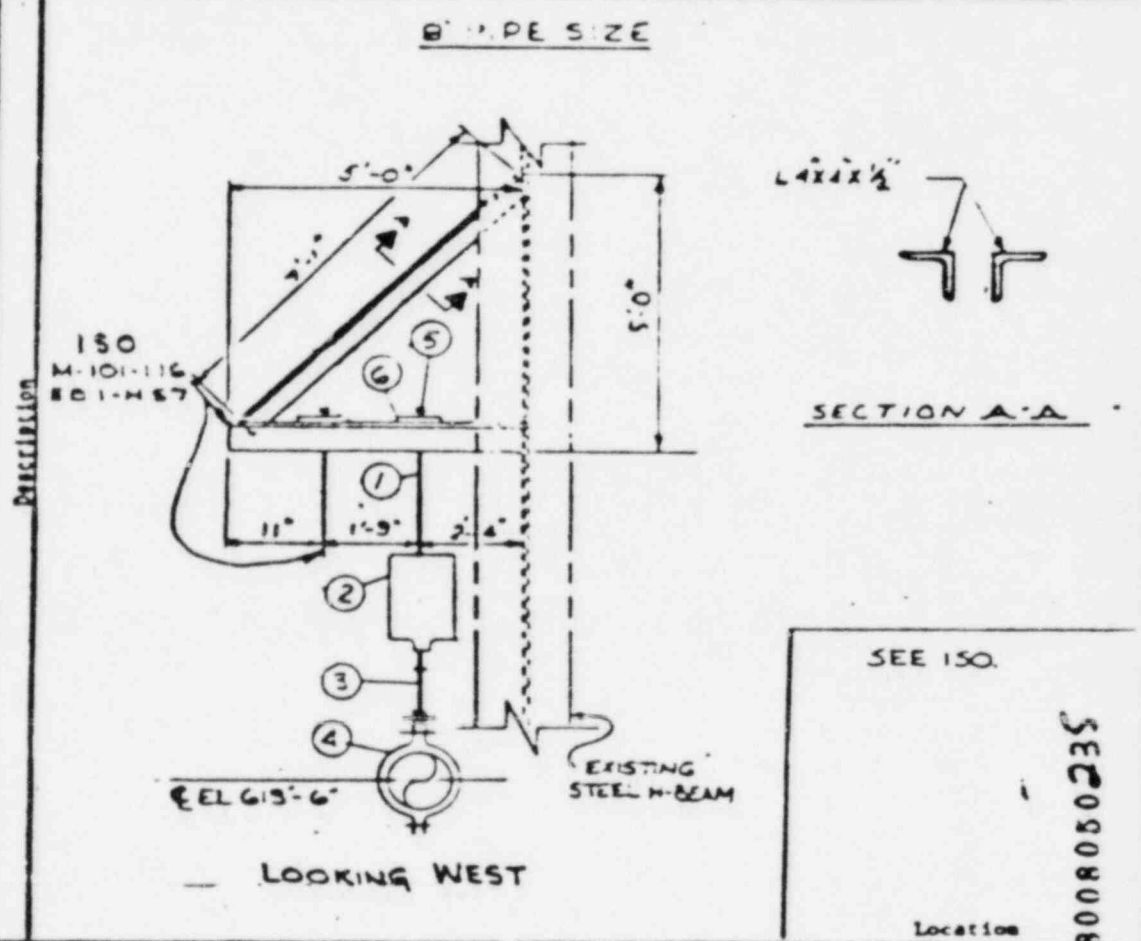
RECVL AND ARMOR, MICHIGAN PALISADES PROJECT JOB 12447	SYSTEM: LEADPIPE LINE Plant Approval: 1/CONTAINMENT P&ID: A: 202
CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	Isometric: SP 25K-CC-2-1 Ref. Dwg: A: 17 Support/Restraint No: CC-1-HI.13

NO.	QTY	DESCRIPTION	UNIT
1	1	SPCA-3 6" PIPE ATTACHMENT (MATH-CSS)	SPCA-3
2	1	RSSA-3 RIGID STRUT ASSY.	RSSA-3
3	1	WT 9x6.5 STRUT TEE X 1 1/2 X 3/4 LG.	WT 9x6.5

10/19/88 AS BUILT
 10/19/88

ONE NO.	THEMEAL	DEADLOAD	WIND	SEISMIC	HYDRO
ONE NO.	THEMEAL	DEADLOAD	WIND	SEISMIC	HYDRO
ONE NO.	THEMEAL	DEADLOAD	WIND	SEISMIC	HYDRO

ITEM	DESCRIPTION
1	3/8" WELDED EYE ROD x 15 1/2" LG
2	VSZA-B VARIABLE SUPPORT HL 550° CL 495° (NOTED LOAD 495°)
3	1/8" WELDED EYE ROD x 2' LG THD 6"
4	8" PIPE SIZE STD 3 BOLT CLAMP
5	5/8" FULL NUT
6	R 3/8" X 6" X 4"



SECTION A-A

SEE ISO.

Location
R00R050235

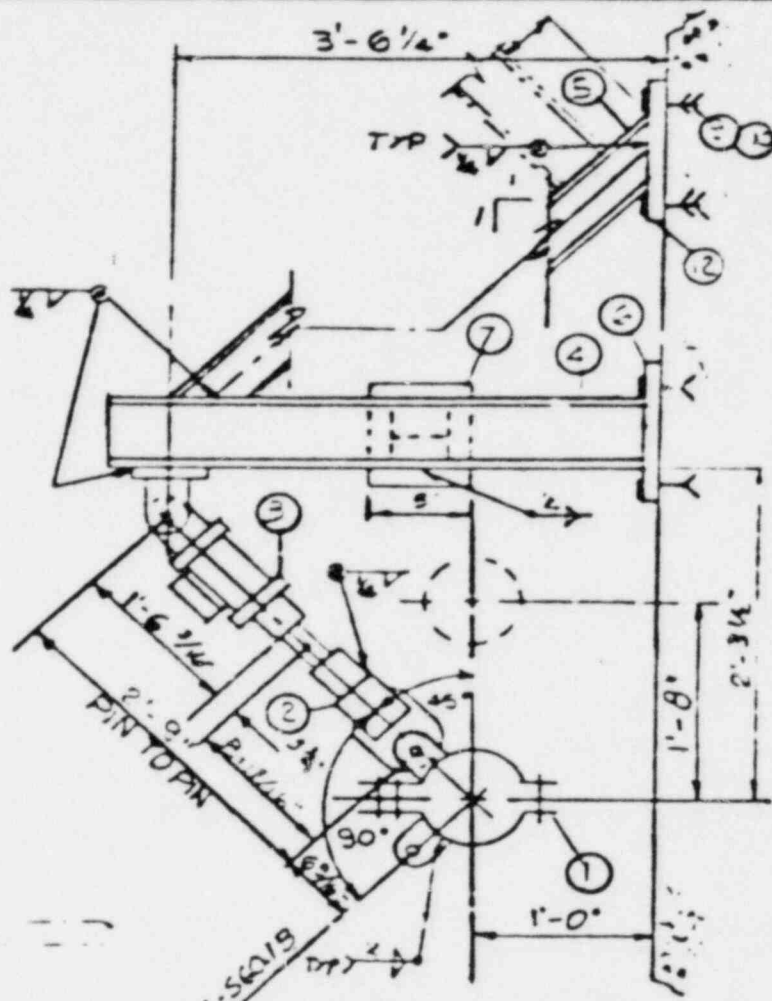
DATE	10/29/78	BY	AS BUILT
REVISION			
PROJECT	BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447		
CLIENT	CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN		
SYSTEM	MAIN STEAM TO H.P. STOP		
PLANT AREA/ROOM	3/COMP COOLING		
P&ID	M-207		
ISOMETRIC	M-101-117		
REF. Dwg	M-39		
SUPPORT/RESTRAINT NO.	ES-H-60		

NO.	REV.	DATE	DESCRIPTION

Date: _____
 Drawn by: _____
 Checked by: _____
 Approved by: _____
 Title: _____
 Project: _____
 Scale: _____
 No. of Sheets: _____
 Sheet No.: _____
 Material: _____
 Quantity: _____
 Remarks: _____
 Inspector: _____
 Date of Inspection: _____

00005037

ASW G.I. L&L
 YEAR 1948
 Description
 AS BILLS
 OF 10/24/48
 REV 10/24/48
 DATE 10/24/48



SHEET 2 of 2

PLAN B-E
SNUBBER-17

PALISADES PLANT
 CONSUMERS POWER COMPANY
 AUXILIARY BLDG.
 STEAM TO P-88 TURBINE



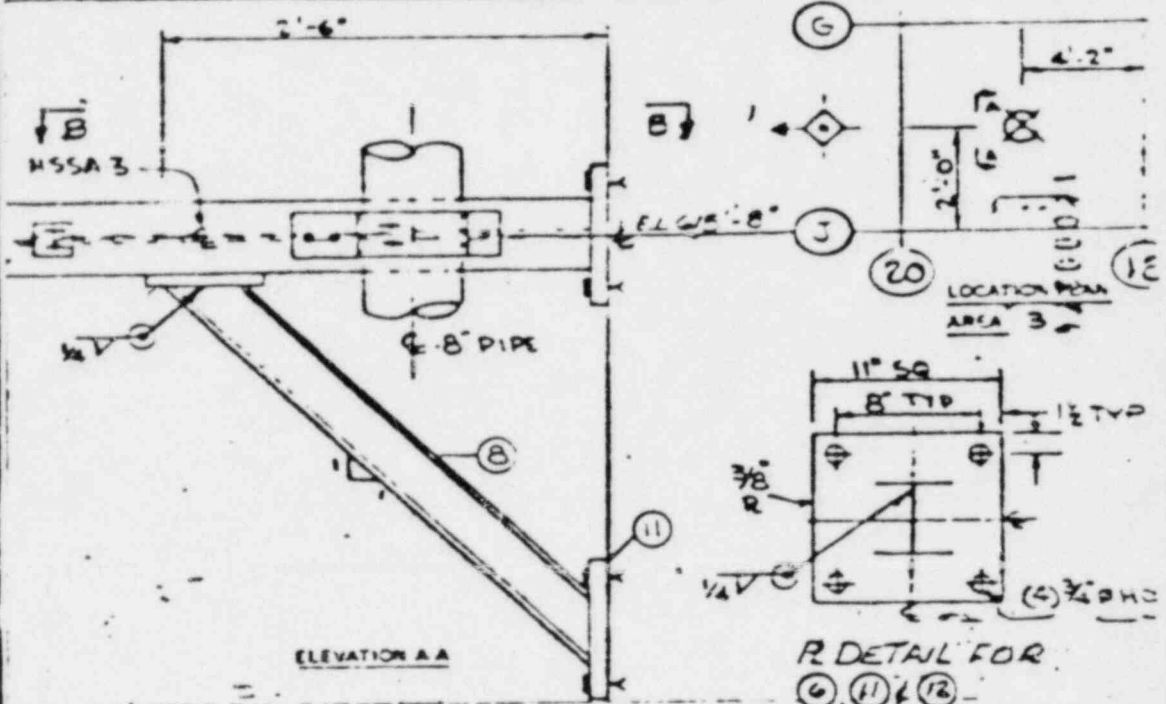
REF DWGS	NO. M-10-117	RE
	PIPE EB-1-B	
	STEEL	
JOB NO.	DRAWING NO.	RE
12447-033	M101-117-560.1A	0-

ASW G.I. L&L
 YEAR 1948
 Description
 AS BILLS
 OF 10/24/48
 REV 10/24/48
 DATE 10/24/48

NO.	DATE	BY	REVISION

Rev	1	ASW	10/24/77
Rev	2	ASW	10/24/77

QTY	UNIT	QTY	DESCRIPTION
1	1	5/8" x 3"	3-BOLT CLAMP, G: 1/2" x 3/2", WELDED W/ TWO 5/8" x 3" LUGS (MATERIAL C.S.)
2	1	5/8" x 3"	STD. CONK ROD CONK W/ B: 11/16" LE
3	1	251	HSSA-3, 6" STACK, 1/2" BORE THERMAL MTG: 4" (2") CONK POSITION SETTING = 3/4" (M.O.C.) END ATTACHMENT ENL. TO AVOID OVERALL STRUT LENGTH = 2'-9"
4	1		4 W/13 BEAM X 3" - B 1/2" LE
5	1		4 W/13 BEAM X 3" - 11/16" LE
6	1		3/8" x 11" CS PL. (M.O.C.)
7	1		3/8" x 5" x 7" CS PL.
8	1		4 W/13 BEAM X 3" - 6/16" LE
9	12	5/16"	5/16" PHILLIPS S&W S-COFF CONK FASTENERS
10	12		5/8" x 1 1/2" LG TAP BOLT
11	1		3/8" x 11" CS PL. (SEE DET.)
12	1		3/8" x 11" CS PL. (SEE DET.)



OFF	10/24/77	ASW	10/24/77
PALISADES PLANT			NO. M-101-117
CONSUMERS POWER COMPANY			REF. DWG. PPL FAI-B
AUXILIARY BLDG		JOB NO. 12447	DRAWING NO. M101-117-5601A
STEAM TO P-S TURBINE			

QTY	UNIT	QTY	DESCRIPTION
1	1		4" STD. WGT. PIPE STANCHION X 1-2 5/8" LG FOR 4" PIPE (MATERIAL C.S.)
2	1		1/2" x 12" x 12" CS PLATE
3	4	5/16"	5/16" PHILLIPS S&W S-COFF CONK. FAST.

Stress Probe: 03941 System: MUSTATO HPEDDY Bldg: AUX Area/Room: 3/COMP COOLING

Exp No: 207 Rev: 1 Ref. Dwg. No: M-39 Rev: C ISO No: M-10-117 Rev: Line No: R M-1-B Ref. Dwg: (R)-3602A Rev: 1

Installation per Detail Dwg. Yes No Type: Wall
 If no, As-Built Dwg. Complete Yes No

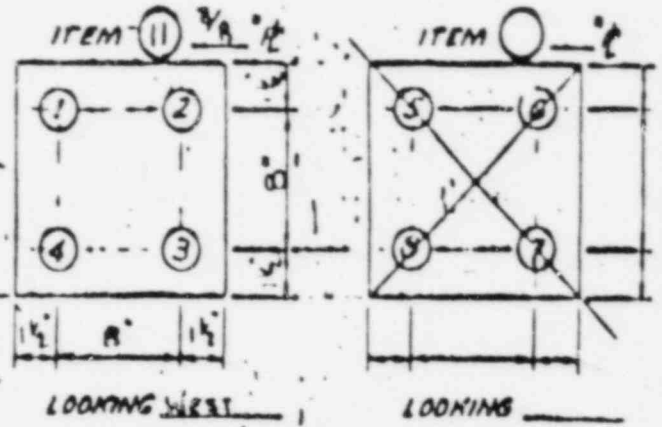
Evidence of Concrete Cracking or Failure: Floor Ceiling
 If yes, show on sketch Yes No

No. of Expansion Anchors: 4 Pipe Elevation: N/A

Measured gap between concrete surface and back of support plate: 0

Walkdown Inspection Signature: *James W. Scott* Date: 10-29-79

Reviewer Signature: *C. Roberts* Date: 1-4-80



CONCRETE EXPANSION ANCHOR

Wedge	Bolt No.	J Wedge	Thread Engag.	Stud Die.	Stud Project.	Stud Length	Embed. Length	Applied Tor./Tm.	Case/Anchor Ident. No.	No. Trns	For Wedge/Pins/Washer OR Shell No. Shell Along Back of Plate	Exposed Thread (in)	Shell Moved or Rotated While Tor.	Nut Ret- (used) Test Method	Comments
	1	R	FULL	1/2"	3/4"										
	2	R	FULL	1/2"	3/4"										
	3	R	FULL	1/2"	3/4"										
	4	R	FULL	1/2"	3/4"										

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved/Unresolved: _____ Repair: _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached

Stress Prob: 0384 System: MAIN STAIR TO HP SEDV Bldg: AUX Area/Room: 2/ COMP COOLING

Exp No: 207 Rev: Ref. Dwg. No: M-17 Rev: 20 ISO No: M-108-117 Rev: Line No: CR-1-2" Hgt. Dwg. No: 1-5601A Rev:

Installation per Detail Dwg. Yes No Type
 If no, As-Built Dwg. Complete Yes No Wall

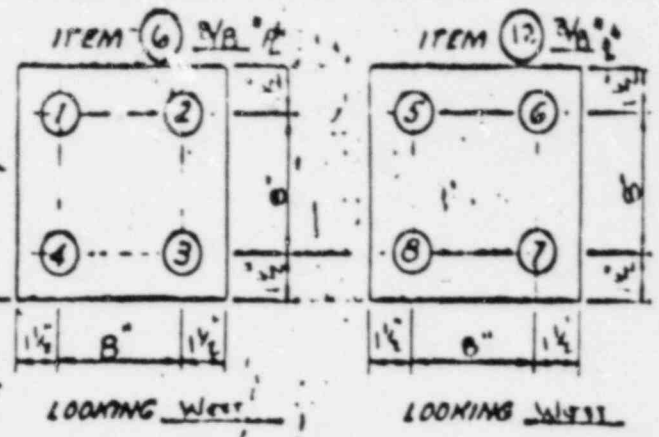
Evidence of Concrete Cracking or Failure Floor
 If yes, show on sketch Yes No Ceiling

No. of Expansion Anchors: 8 C. Pipe Elevation: N/A

Measured gap between concrete surface and back of support plate: 0

Walkdown Inspector Signature: James W. Bond Date: 10-29-79

Reviewer Signature: C. Lubrano Date: 1-7-80



CONCRETE EXPANSION ANCHOR

Wedge	Bolt No. (Per Sketch)	J or R	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Applied Tor./Tens.	Case/French Ident. No.	No. Pins/Washer, OK	For Wedge-It No. Spacing Mark of Plate	Exposed Thread (in)	Nut Bottomed	Test Method	Comments
	1	R		FULL	1/2"	2"										
	2	R		FULL	1/2"	3"										
	3	R		FULL	1/2"	1/4"										
	4	R		FULL	1/2"	1"										
	5	R		FULL	1/2"	1 1/4"										
	6	R		FULL	1/2"	1 3/16"										
	7	R		FULL	1/2"	1 1/2"										
	8	R		FULL	1/2"	1"										

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____

Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: None Repair

Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached

LIAG OFI Rev

Comments

10-29-79

10-29-79

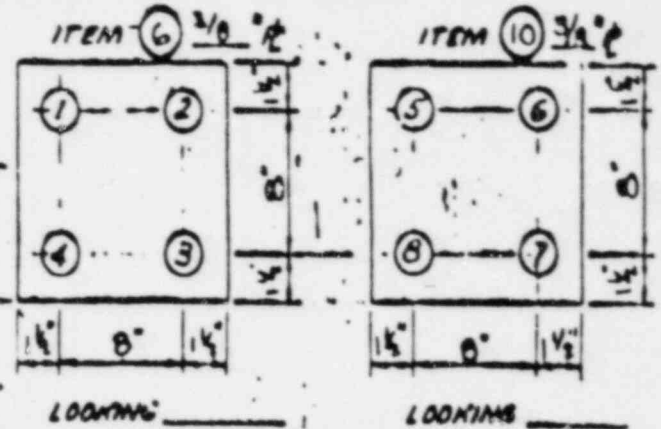
OFI	10/21/79	AS BULLS	AIW	G.T.	W.D.
Rev	Date	Description	Drawn	Chkd	Appvd

PROJECT: MAIN STAIR TO HP SEDV BLDG: AUX AREA/ROOM: 2/ COMP COOLING
 EXP. NO: 207
 DATE: 10/29/79
 DRAWN BY: G.T.
 CHECKED BY: W.D.
 APPROVED BY: AIW

INIG
Rev: 1

3-12
 Stress Prob: 03341 System: MUGU TO HP 0004V Bldg: AVX Area/Room: 3/CAMP COOLING
 Exp No: 207 Rev: 1 Ref. Dwg. No: M-39 Rev: 2 ISO No: M-01-17 Rev: 1 Line No: EB 1-8 Hgt. Dwg: EB 1-8 (B) Rev: 1

Installation per Detail Dwg. Yes No X
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure If yes, show on sketch Yes No X
 No. of Expansion Anchors: 8 Pipe Elevation: N/A
 Measured gap between concrete surface and back of support plate: 0
 Walkdown Inspector Signature: *James W. Lamb* Date: 10-29-79
 Reviewer Signature: *C. Urbace* Date: 1-4-80



CONCRETE EXPANSION ANCHOR

Wedge	Bolt No. (Per Sketch)	J or S	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Applied Tor./Yr.	Case/Struc. Ident. No.	No. Trns.	For Wedge Pins/Washer OK	Exposed Thread (in)	Nut Set-torced	Comments
Shell			Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length			No. Trns.	Shell Moved or Rotated While Tor	Test Method		
	1	R	FULL	1/2"	1"										
	2	R	FULL	1/2"	1"										
	3	R	FULL	1/2"	1 1/2"										
	4	R	FULL	1/2"	1 1/2"										
	5	R	FULL	1/2"	1 1/4"										
	6	R	FULL	1/2"	3/4"										
	7	R	FULL	1/2"	3/4"										
	8	R	FULL	1/2"	N/A"										

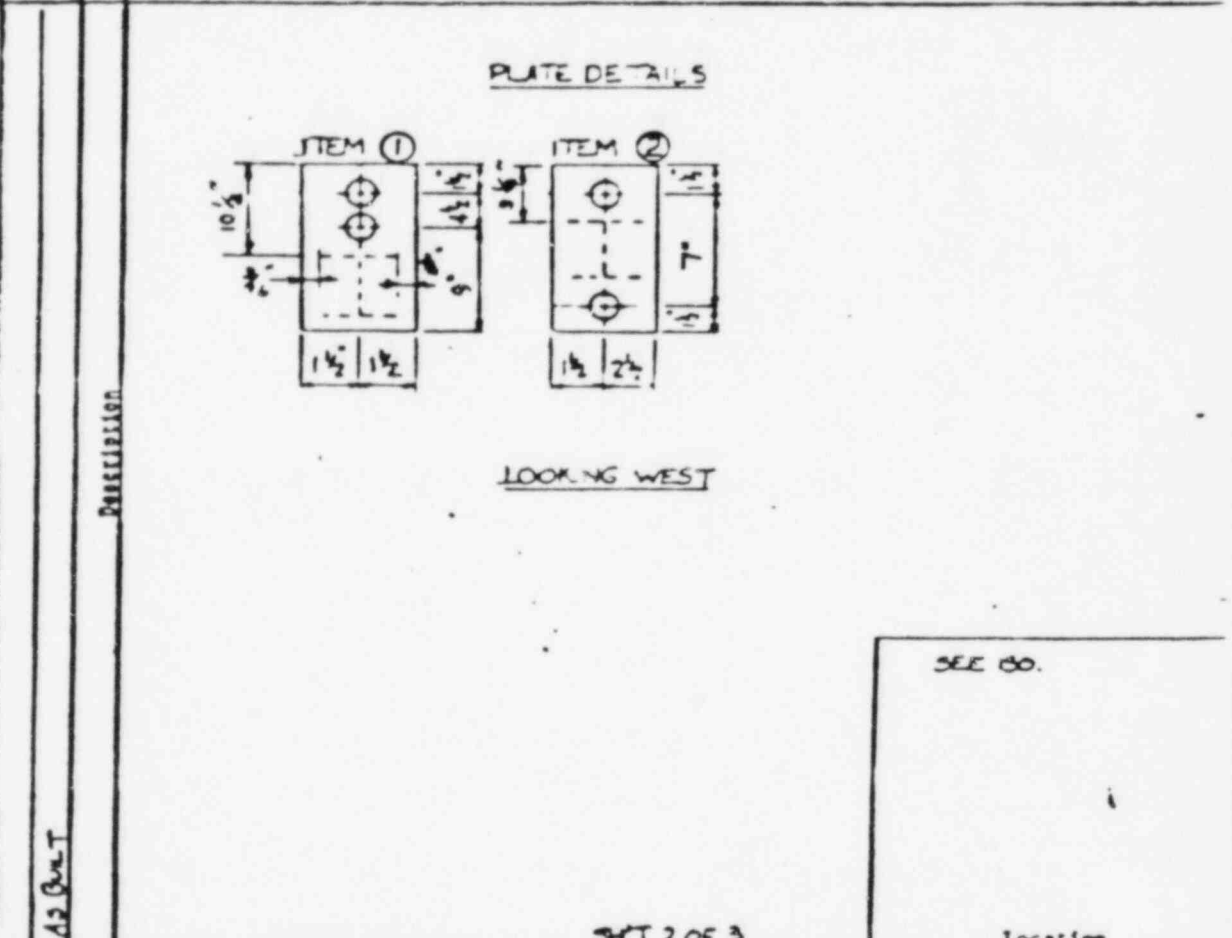
UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: Known _____ Repair _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached _____

Comments
 12-17-03 11-1 11-1 A

EX
 Rev.
 CONCRETE EXPANSION ANCHOR
 PASSENGER
 CONCRETE EXPANSION ANCHOR
 PASSENGER
 11-1 A

REV. 1	PALISADES PROJECT JOB 12447	PAGE 1 OF 3
REV. 2	CONSUMERS POWER COMPANY PALISADES	DATE: 10/20/72
REV. 3	COVERT, MICHIGAN	REF. Dwg: M-17
		SUPPORT/RESTRAINT No: EB-1-452

Item	Description
9	4 #30 CONG FASTENERS (4 REQ'D)
10	1 "6 THREADED ROD 1'-2" LG.
11	1/2" DIA VAR SPT (NOTED LOAD N/A, NOTED TRAVEL N/A) (2) REQ'D
12	I-BEAM, 4" X 2 1/2" X 1/4" X 2'-0" LG (2) REQ'D
13	1" WELDED EYE-ROD, 1'-8" LG



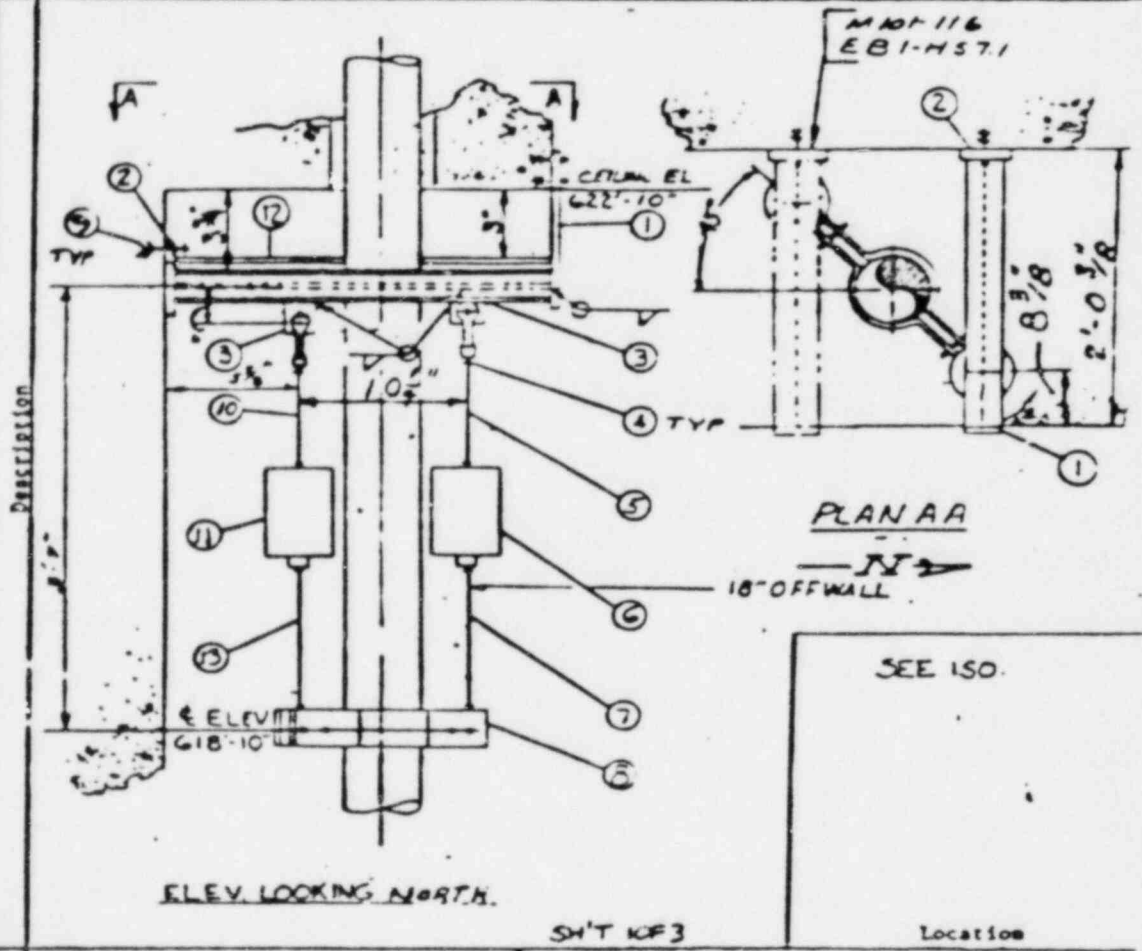
REV. 1	10/20/72	AS BUILT	DESCRIPTION	System: MAIN STEAM TO H.P. STOP
REV. 2			BECHTEL ANN ARBOR, MICHIGAN	Plant Area/Room: 3/COMP. COOLING
REV. 3			PALISADES PROJECT JOB 12447	PHID: M-207
REV. 4			CONSUMERS POWER COMPANY PALISADES	Isometric: M-10-117
REV. 5			COVERT, MICHIGAN	Ref. Dwg: M-26
				Support/Restraint No: EB-1-452

NO.	12-7-033 7-2 / 77-3
REV.	
DATE	
BY	
CHECKED	
APPROVED	
COMMENTS	

J12 10/20/72 AS BUILT

ADD'L INFO: _____
 Draw No: 17
 Installation: _____
 If no, As-Is: _____
 Evidence of: _____
 If yes, when: _____
 No. of Pages: _____
 Prepared by: _____
 and by: _____
 Material: _____
 Signature: _____
 Reviewer: _____
 Signature: _____
 Date: _____
 Title: _____
 Scale: _____
 Project: _____
 Drawing No: _____

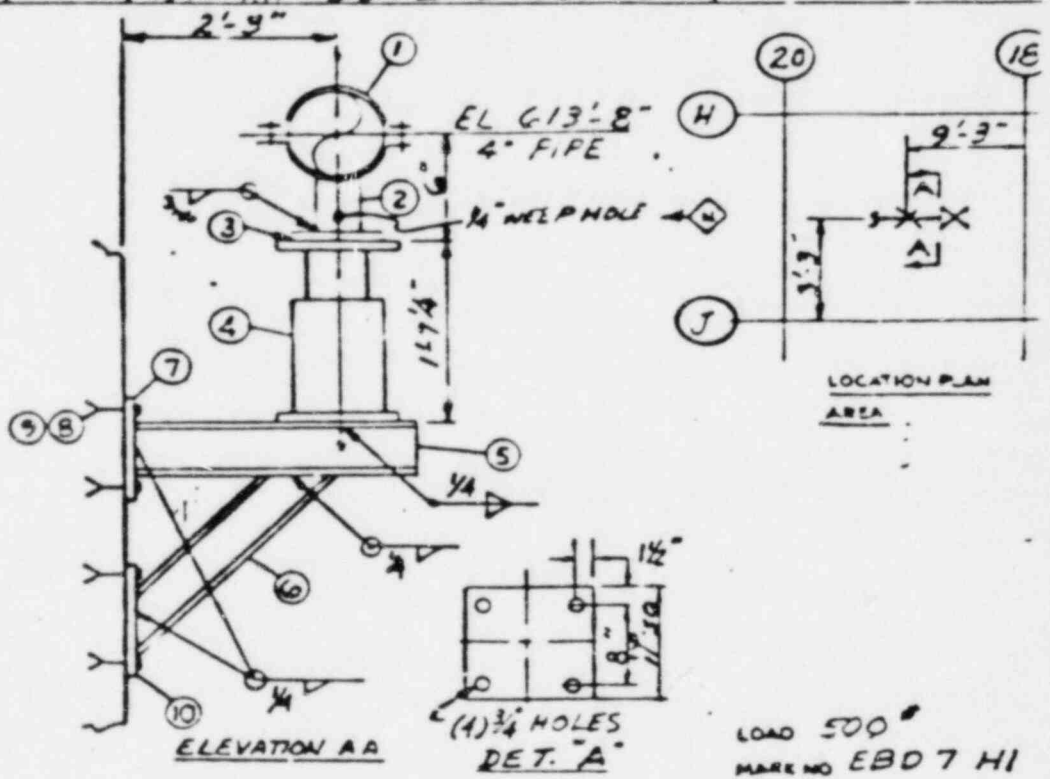
Item	Description	QTY
1	R 7/8" x 3" x 15"	1
2	R 1" x 4" x 10"	1
3	SIZE B, WELDING CLEVIS ATTACH	2
4	1" Ø FULL NUT	6
5	1" Ø THREADED ROD 1-2 LG	
6	V52A-13 VAR SUPT (NOTED LOGO 2435.1", LOAD RAVE 4/A)	
7	1" Ø WELDED EYE ROD 1-2 LG	
8	STD 6 BOLT RISER CLAMP FOR 8" PIPE (SEE SH3)	



I.P.	REV.	AS BUILT	DESCRIPTION	LOCATION
		02/07/73		
BECHTEL	System: MAIN STEAM TO H.P. STOP VALVE			
AND ARBOR, MICHIGAN	Plant Area/Room: 3/COND COOLING			
PALISADES PROJECT JOB 12447	PAID: M-207			
CONSUMERS POWER COMPANY	Isometric: M-101-R7			
PALISADES	Ref. Dwg: M-39			
COVERT, MICHIGAN	Support/Restraint No: EB-H-52			

Item	Description
1	SIZE 4 WELDING LUG
2	3/8" x 2 1/2" LG BOLT & NUT
3	5/16" - 4 VAR. SUPT HL 175" CL 175" MVT W/ LUG LOAD
4	1/2" x 4 WELDED EYE ROD 1-2 LG

NO.	QTY	DESCRIPTION
1	1	SP175 4" (3" x 1/4") STD TWO BOLT PIPE CLAMP
2	1	2" STD WGT PIPE STANCHION X 9'-3 1/4 LG (MATERIAL: C.S.)
3	1	3/8" x 4" x 4" C.S. PLATE
4	1	W4F #7 VARIABLE SUPPORT TYPE 'F' HL = 500# C.L. = 456" MYT = 1' DN = 11V1 STOPS. (NOTED LOAD 450105)
5	1	W4X13 BEAM X 2'-8" LG
6	1	W4X13 BEAM X 3'-1 1/4" LG
7	1	3/8" x 11" x 11" C.S. PLATE (SEE DET. A)
8	8	5/8" CONC. FASTENER
9	8	5/8" x 1 1/4" TAP BOLT
10	1	3/8" x 11" x 11" C.S. PLATE (SEE DET. A)



PAUSADES PLANT CONSUMERS POWER COMPANY		130 AAO-EBD-7-1 M-39-20 C 107-22124
PIPE SUPPORT - AUX BLDG	12447-033	EBD-7-HI
STM TO P 8B TURBINE		

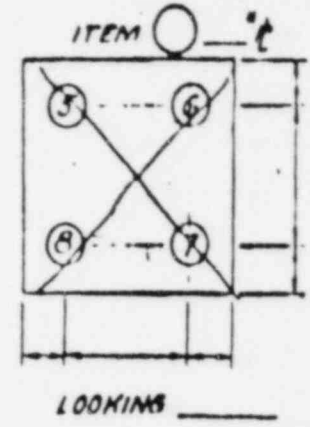
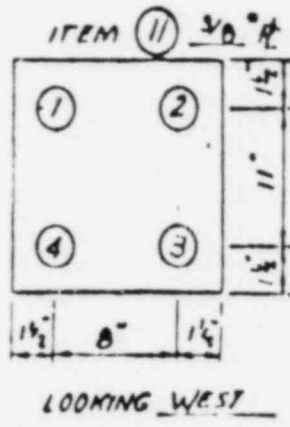
ITEM	DESCRIPTION
1	5/8" CONC FASTENERS (5 REQ'D)
2	C3X50" X 1'-6" LG
3	W6X200" X 1'-2" LG

ITEM	DESCRIPTION
7	W4 X 13 C X 1/4" O.D.
8	WELDED BEAM ATTACHMENT SIZE 6 BP #113 (4 REQ'D)
9	WELDLESS EYE NUT SIZE 6 BP #274 (5 REQ'D)

43

Stress Proj: 03858 System: STM TO PABT WRAE Bldg: Aux Area/Room: 3 / COMP COOLING
 HExp No: M 207 Rev: Ref. Dwg. No: M 39 Rev: ISO No: AA0 Rev: EBD 7-4 HExp No: EBD 7-H3 Rev: 157

Installation per Detail Dwg. Yes ___ No ___ TYPE
 If no, As-Built Dwg. Complete Yes ___ No ___ Wall X
 Evidence of Concrete Cracking or Failure Floor ___
 If yes, show on sketch Yes ___ No Ceiling ___
 No. of Expansion Anchors: 4 Pipe Elevation: 613'-8"
 Measured gap between concrete surface and back of support plate: None
 Walkdown Inspector Signature: *B.B. Johnson* Date: _____
 Reviewer Signature: *Allen J. Williams* Date: 2/11/20



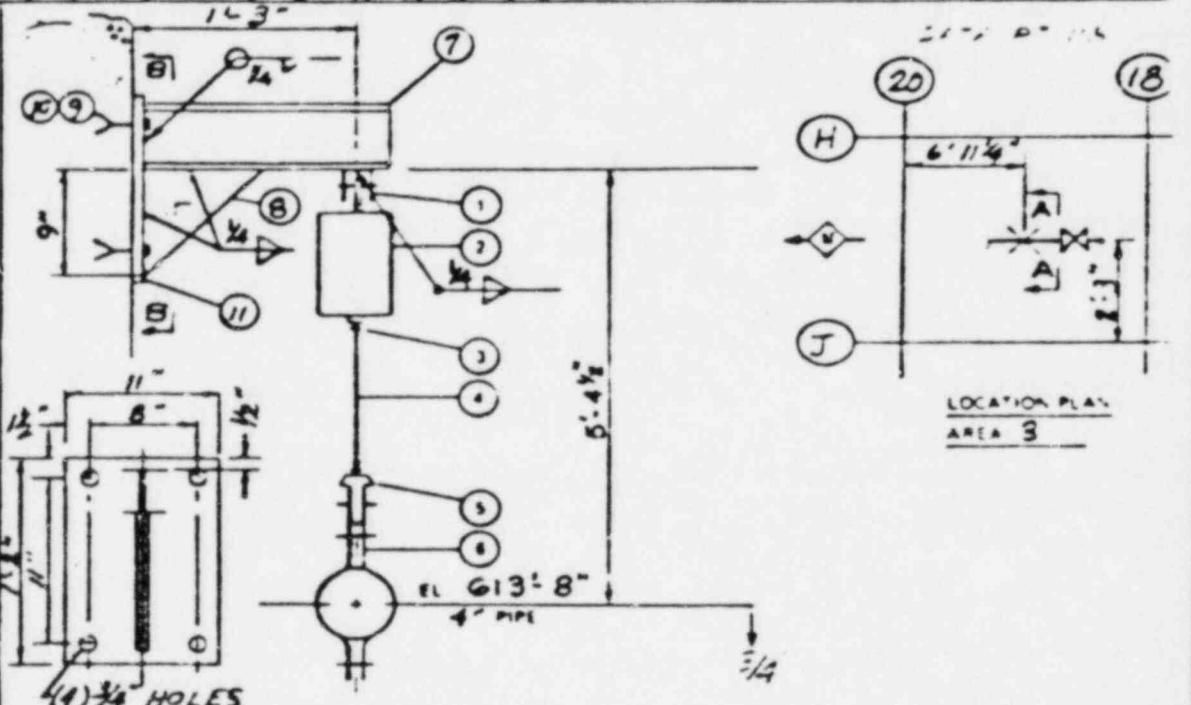
CONCRETE EXPANSION ANCHOR

Wedge	Bolt No. (Per Sketch)	J or R	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Applied Tor./Yen.	Case/Wrench Ident. No.	No. Trns.	For Wed-it Pine/Washer, OK	Exposed Thread (in)	Nut Rot-tomed	Comments
Shell		S	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length			No. Shell Hinge Mark of Plate	Shell Moved or Rotated While Tor.	Test Method	Passes Anchor	
	1	S		N/A	5/8"	N/A									
	2	S		N/A	3/8"	N/A									
	3	S		N/A	3/8"	N/A									
	4	S		N/A	1/2"	N/A									

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: _____ Repair: _____

REV	DATE	DESCRIPTION	BY	CHECKED
157	1/10/11	As Built	AW	AW

NO.	QTY	SIZE	DESCRIPTION
1	1	#5	CLAMP HALF
2	1	#7	CLAMP HALF
3	2	5/8"	WASHER
4	1	193	WASHER
5	1	274	WASHER
6	1	304	WASHER
7	1	-	W4X13 BEAM X 15 L6
8	1	-	3/8 X 19 C.S. PLATE SPACING
9	4	5/8"	CONG. FASTENER
10	4	-	3/8 X 1 1/4" TAP BOLT
11	1	-	30 X 11 X 1/2" C.S. PLATE

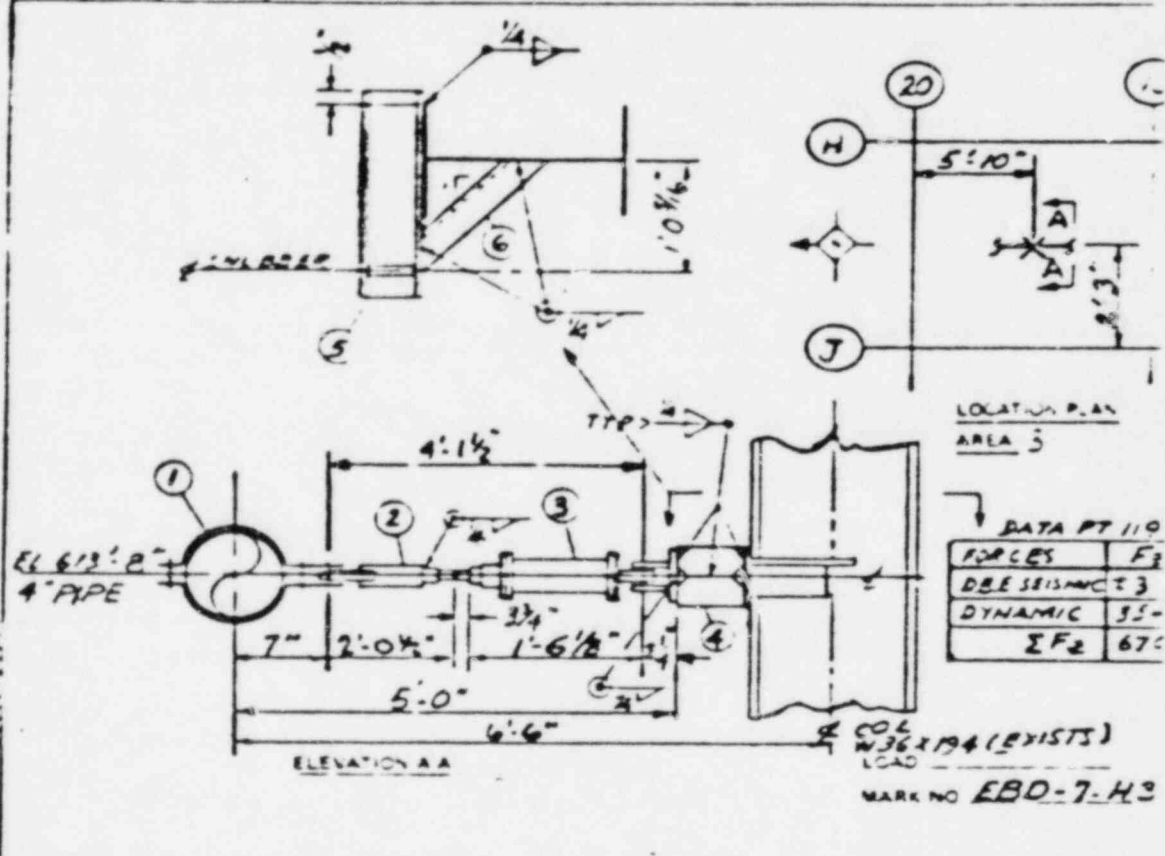


(4) 3/4" HOLES
 SECT. B-B
 ELEVATION A-A
 LOAD 480#
 MARK NO EBD-7-H2

PALISADES PLANT CONSUMERS POWER COMPANY		REF. NO. EBD-7-1 DWGS. NO. M-39-20 STEEL C-107-12# C-124
PIPE SUPPORT - AUX. BLDG. STM TO P-8B TURBINE	JOB NO. 12447-033	DRAWING NO. EBD-7-H2 / 1F

NO.	QTY	DESCRIPTION
(1)	1	4" Ø PIPE CLAMP HALF, PART NO. 370 TYPE 1
(2)	58	3/8" X 1 1/4" HEX HD BOLT W/ NUTS (4 REQ -)

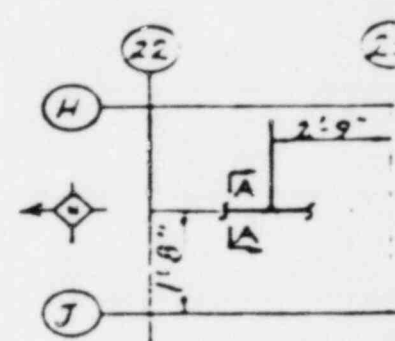
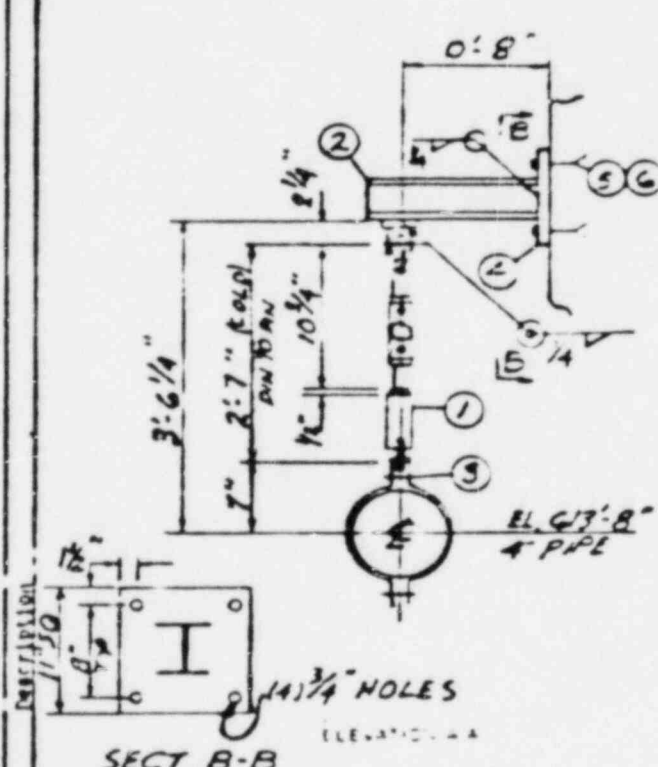
1	1	WELDED 4" P.P.E ATTACHMENT (MATERIAL C.S.)
2	1	PISTON ROD CONNECTION "B" 3 3/4"
3	1	251 MESA-S 5" STROKE 1/2" BOFF COLD POSITION SETTING = 3 3/4" (MIDDLE) OVER ALL STRUT LENGTH = 5'-1 3/4" W/ A.E. RADIATION FLUID OR EQUAL
4	2	3/2" X 1/2" X 3/4" C.S. STIFF R
5	1	4 X 13 BEAM X 1'-9 1/2" LG
6	1	3 X 3 X 1/2 ANGLE X 1'-5" LG (CUT BOTH ENDS 45°)



FALISADES PLANT
 CONSUMERS POWER COMPANY
 PIPE SUPPORT- AUX. BLDG.
 STM TO P-8B TURBINE

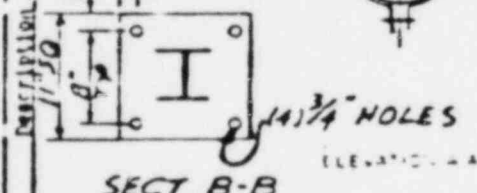
 SAN FRANCISCO	REF DWGS	NO A40-EBD-7-1 PIPE M-39-20 STEEL C-107-12 & C-12-
	JOB NO 12447-033	DRAWING NO EBD-7-R3

1	1	—	ASSA-3 STRUT ASSEMBLY
2	1	—	1/4" X 1/2" BEAM 10'-11" LG
3	1	SEER3	4 PIPE END ATTACHMENT W/ LOCKWASHERS (MATERIAL: C.S.)
4	1	—	3/8" X 11" X 11" C.S. PLATE
5	4	512	3/8" CONC. FASTENER
6	4	—	5/8" X 1 1/4" TAP BOLT



LOCATION PLAN
AREA 2
DATA PT. 128

FORCES	F _y
PBE SEISMIC	264
DYNAMIC	126
THERMAL	210
WEIGHT	180
IF _y	526
P-EST F _y	75

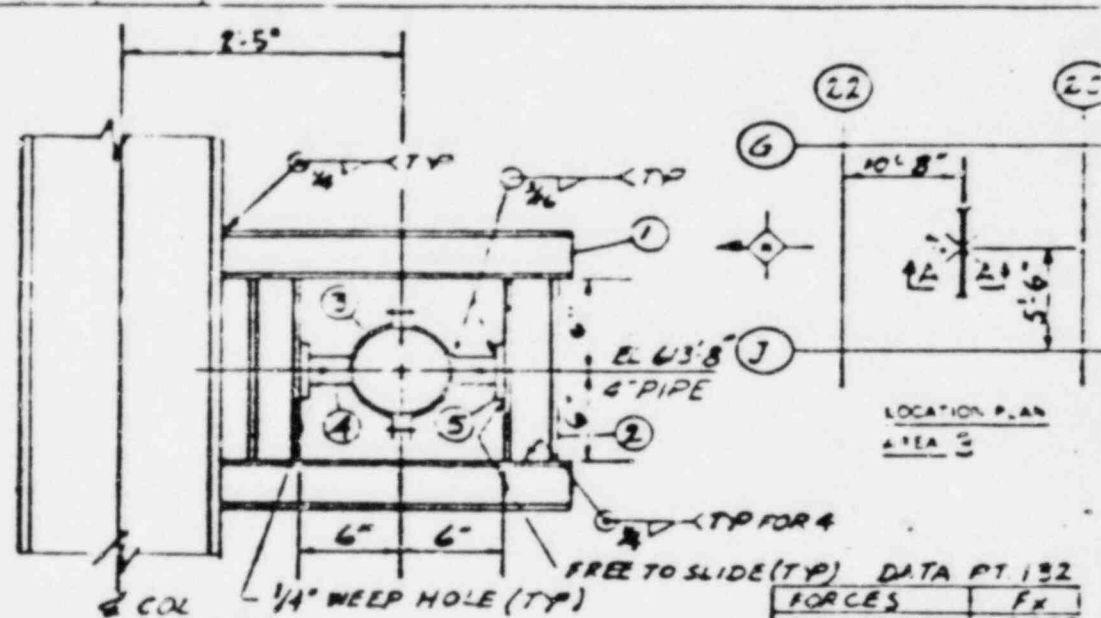


HYDRO LOAD -
LOAD -
MARK NO EBD-7-H-

OPI 10/15/74 AS BUILT DATE FILE	PALISADES PLANT CONSUMERS POWER COMPANY		NO. MAO-EBD-7-1 REV. M-39-20 1" = 1' C-107-12 & C-125
	PIPESUPPORT AUX BLDG STM TO P-8B TURBINE	JOB NO 12447-033	DRAWING NO EBD-7-H4'

Engineering Evaluation: Acceptable Signature:

1	2	-	W4X13 BEAM X 1'-1 1/2" LG
2	2	-	W4X13 BEAM X 1'-0" LG
3	1	175	4" (3/16" STD. TND BOLT PIPE CLAMP PROPER SPEC.)
4	2	-	2" STD WGT PIPE STANCHION I.D. 3 1/16" LG
(MATERIAL C.S.)			
5	2	-	3/8" X 4" X 4" CS. PLATE



DATA PT 132

FORCES	Fx
DBE SEISMIC	242
DYNAMIC	628
THERMAL	746
WEIGHT	-9
Σ Fx	1607

LOAD
 MAKE NO EBD-7-H5

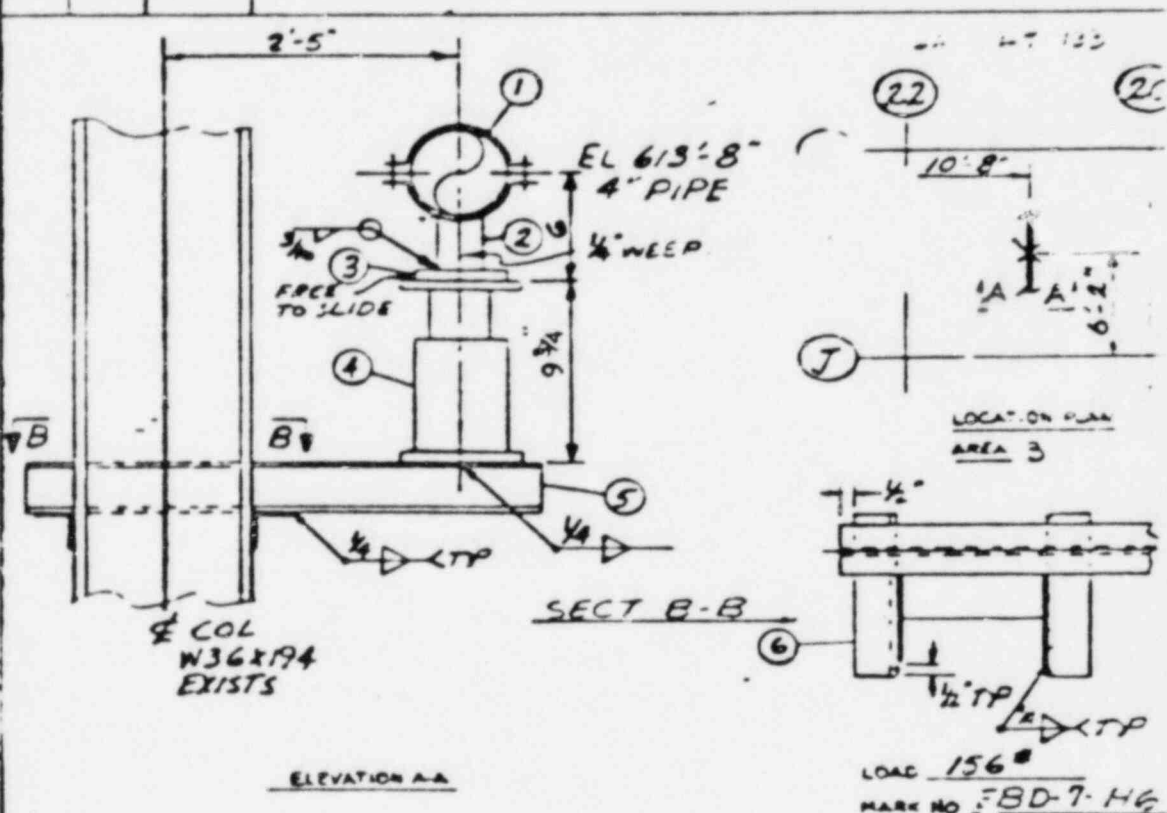
PALISADES PLANT
 CONSUMERS POWER COMPANY
 PIPE SUPPORT-AUX. BLDG
 STM. TO P-8B TURBINE



NO AAO-EBD-7-1-
 REF PPE M-39-20
 STEP C-107-12 & C-108-
 JOB NO 12447
 023
 DRAWING NO
 EBD-7-H5

REV	DATE	DESCRIPTION	BY
1		ISSUED FOR CONSTRUCTION	
2		REVISED PROJECT JOB NO.	
3		CONSUMER POWER COMPANY	
4		PALISADES	
5		CHRYST, MORGAN	

QTY	UNIT	DESCRIPTION
1	ITS	4" (3" X 1/4") STD. TWO EOLT PIPE CLAMP
2	1	2" STD WGT PIPE STANCHION X D - 3 1/2 LG (MAYL - C.S)
3	1	3/8" X 4" X 4" C.S. PLATE
4	1	VSZF VARIABLE SUPPORT TYPE F - HL - 156" C.L. - 142" MYL - 1/2" IN W/TK STOPS (NOTED LOAD 145)
5	1	W4 X 13 BEAM X 4'-9" LG
6	2	3 L X 1/2" ANGLE X 1'-5" LG



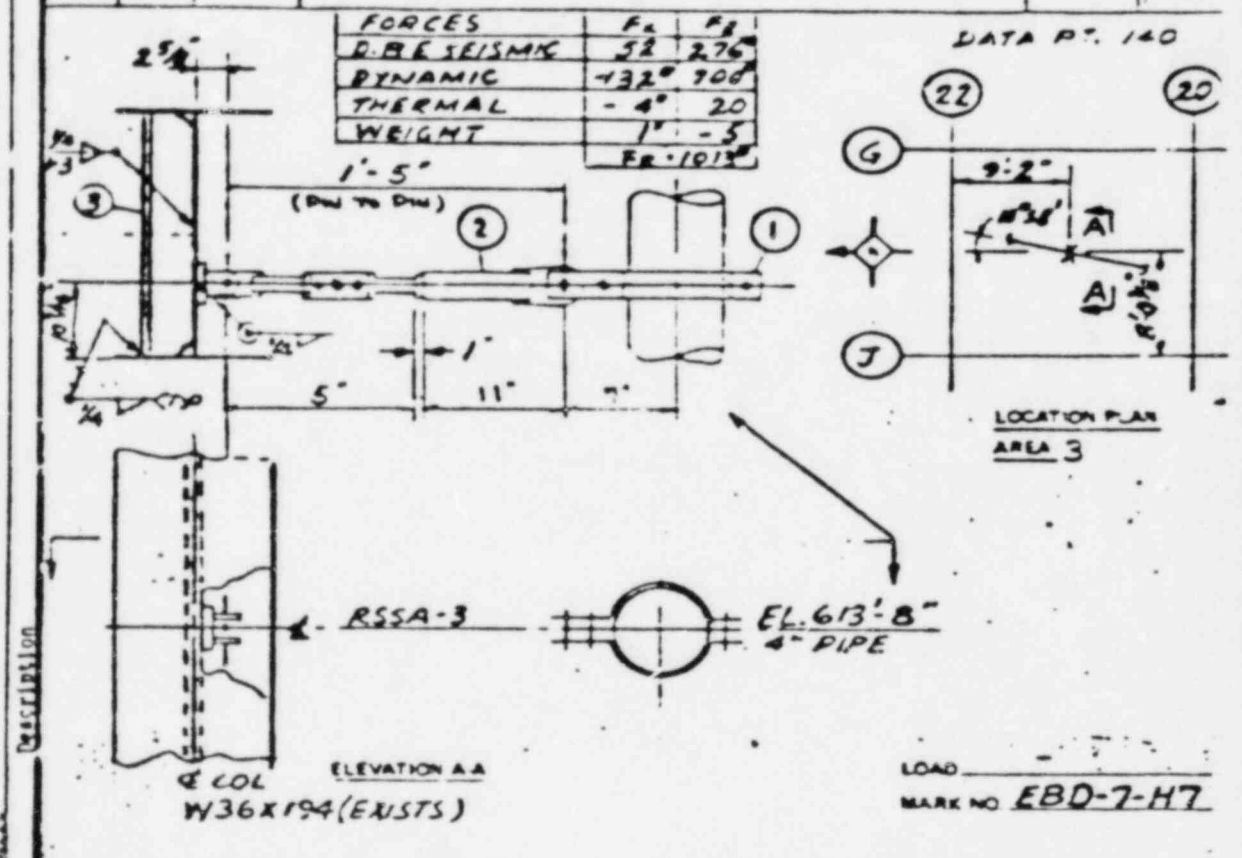
REV	DATE	DESCRIPTION	BY
1	10/11/78	AS BUILT	
2			
3			
4			
5			

PALISADES PLANT			NO. MAO-EBD-7-1
CONSUMERS POWER COMPANY			DATE M-39-20
PIPE SUPPORT - AUX. BLDG.		JOB NO. 12447-033	DRAWING NO. C-107-12/124
STM. TO P 8 B TURBINE			EBD-7-H6

INSPECTION AND TESTING RECORD FOR PIPESUPPORT/RESTRAINT		12447-033 C-90 (G)
		12447-033 FF-2 / FF-3 ATT.
NO.	DATE	BY

PALISADES PLANT CONDENSER POWER COMPANY PALISADES COUNTY, NEW YORK	LEADERSHIP LINE PROJECT NO. 1200-100-100-100 DRAWING NO. C-107-12-1 SHEET NO. 17 SUBJECT: RESTRAINT NO. C-107-12-1
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1	1	SSCA-3	4"	PIPE ATTACHMENT (W/TLCS)
2	1	-	-	RSSA-3 RIGID STRUT ASSY.
3	1	-	-	WT 4x6.5 STRUCT TEE X 1'-4" LG.



PALISADES PLANT CONSUMERS POWER COMPANY PIPE SUPPORT - ALX. BLDG STM. TO P-8B TURBINE		REF. DWGS. NO. AAQ-EBD-7-1 M-39-20 STEEL C-107-12-1 & C-124
	JOB NO. 12-47-033	DRAWING NO. EBD7-R7

INSPECTION AND TESTING RECORD FOR PIPESUPPORT/RESTRAINT

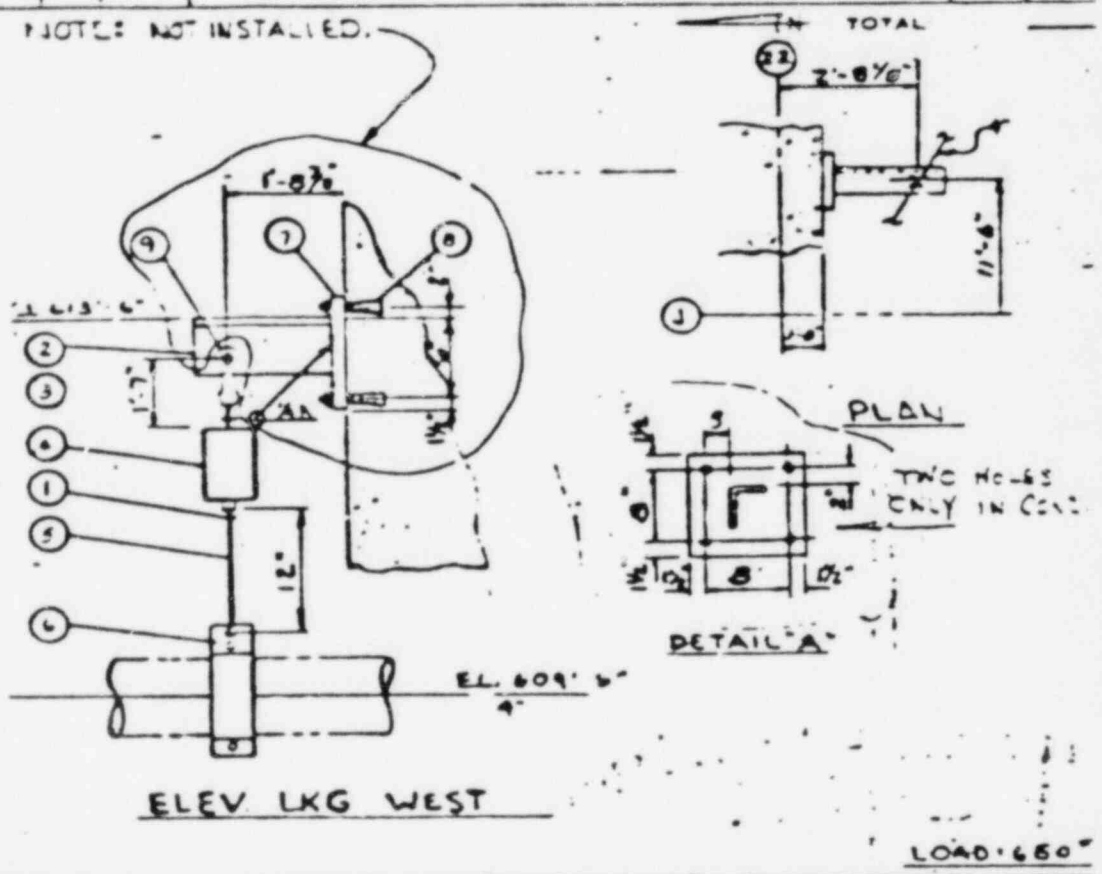
12-47-033	12-47-033	12-47-033	12-47-033	12-47-033	12-47-033	12-47-033	12-47-033	12-47-033	12-47-033
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12-47-033 12-96 G
12-47-033 FT-1 FT-3 Acc.

Stress Prob/Q	UT Inspector At
Map No. 207	Discrepancies (
Installation per	Engineering Pve
If no As-Built	
Evidence of Cor	
If yes, show	
No. of Expansion	
Measured sep be	
and back ome	
Walkdown Inspec	
Signature	
Reviewer	
Signature	
Wedge	
Shell	

Rev 1/11/71
Date

QTY	CHD	ASW	Item	Description
2				2 HEX NUTS
1				1 1/4" x 1/2" x 11'-9" LG
1	133A			3/8" HANGER ROD - 1'-7" LG T. 6 T. 6"
1				V52A - 6 YAR SUPT WL. 650' EL. 776 1/4"
				1/2" DIA. UPPER PIPE
1	92A			1/2" WELDED EYE ROD - 1'-6" LG THD. 6"
1	306			4" O PIPE SIZE STD 3 BOLT PIPE CLAMP
1				11" x 3/8" x 11" R (TAIL A)
4	512			7/8" CONX FASTENER W/ 7/8" x 1 1/2" HEX HD BOLT
1				SIZE 2 - 3/8" x 3/8" PIN - 3/8" GRD. CLAVIS



DESCRIPTION: ELEV LKG WEST

DATE: 11/13/71

BY: JH

PROJECT: AUS FW PUMP TURBINE PIPING SYSTEM STEAM SUPPLY

REFERENCE DWG. M-153 REVIS 1

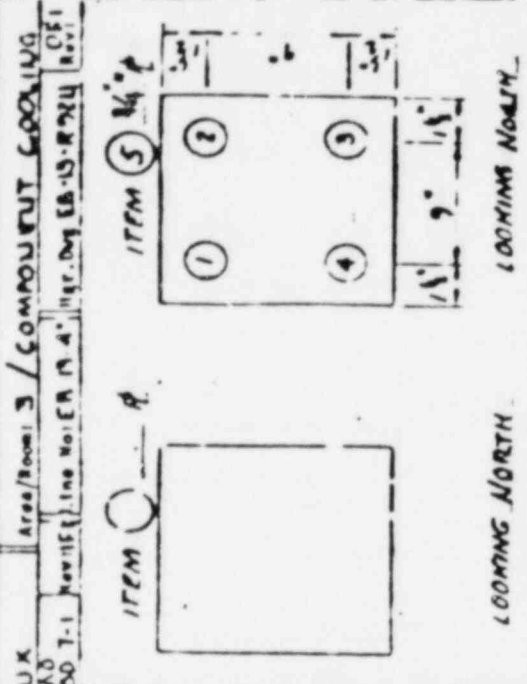
MARK NO. EBB-H921 NO. 8209 - 1

BERGEN-PATERSON PIPESUPPORT CORP.

DESIGN	JH	CHKD	HT	APPROV	3-6
DATE	11/13/71	BY	JH	NO.	8209

INSPECTION AND TESTING RECORD FOR PIPESUPPORT/RESTRAINT 12447-033 C-96 (10)
12447-033 P-1 /TP-3 Acc.

Rev	1	DATE	11/13/71	BY	JH
Rev	2	DATE		BY	
Rev	3	DATE		BY	



System: STAM TO RBE TURBINE
 Ref. Des. No: M-37
 Rev: 20
 Issue No: 600 T-1
 Revision: Line No: EA 11 4"
 Iss. by: Dg. 15-13-R724
 Rev: 1

Installation per Detail Dwg. Yes No
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure Yes No
 If yes, show on sketch Yes No
 No. of Expansion Anchors: 4
 Elevation: 11'-0"

"measured gap between concrete surface and back of support plate": 0

Walkdown Inspector: [Signature] Date: 11/25/70
 Reviewer: [Signature] Date: 1/1/71

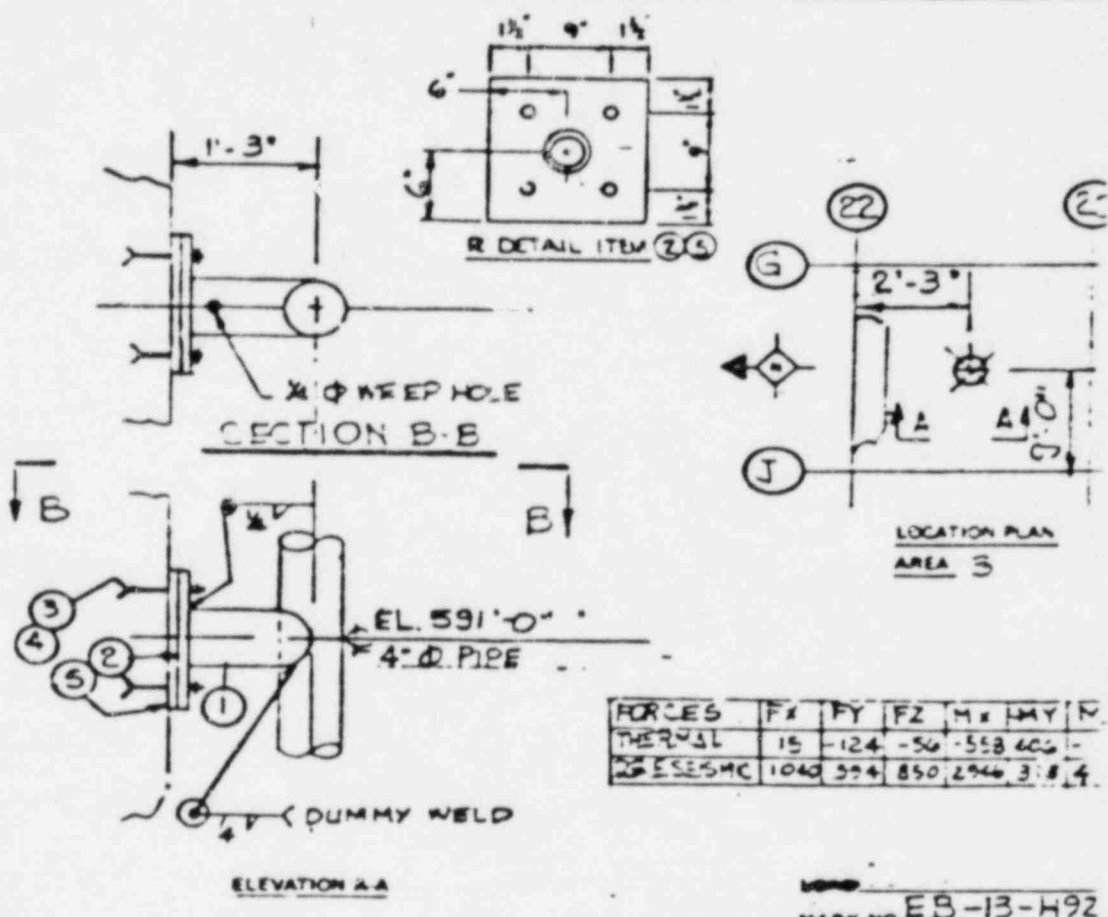
CONCRETE EXPANSION ANCHORS

Wedge	J Mejt-It & Hedge	Thread Engag.	Stud Dia.	Proj. Length	Stud Length	Fabed. Length	No. Pins/ Pins, Washer, OK	for Mejt-It Thread (In. Used)	Exposed Thread (In. Used)	Comments
1	R	FULL	3/4"	1"						
2	R	FULL	3/4"	3/4"						
3	R	FULL	3/4"	3/4"						
4	R	FULL	3/4"	1"						

Inspector Signature: _____ Date: _____
 Testing Inspector Signature: _____ Date: _____
 Discussed (Circle) Yes/No: _____ Reported (Circle) Yes/No: _____
 Inspection Log Reviewed: _____
 Date: _____

DATE	10/27/51	CONSUMERS POWER COMPANY	PROJECT	STEEL
OFF	BY	AUXILIARY BLDG.	12447	DRAWING
		STEAM TO P-S TURBINE		M-101-117-5601A

NO.	QTY	SIZE	DESCRIPTION
1	1	-	4" STD. WGT. PIPE STANCHION X 1-2 3/8" LG FOR 2" PIPE (MATL. C.S.)
2	1	-	1/2" X 12" X 1/2" CS PLATE
3	2	5/16"	PHILLIPS SMD OFF CONC. FAST.
4	2	-	3/8" X 1/2" TAP BOLT
5	1	-	3/4" X 12" X 1/2" CS PLATE



FALISSEDES PLANT			NO	AAO-EBD-1-1
CONSUMERS POWER COMPANY			REF	M-38-20
AUXILIARY BLDG.		STEEL	C-104-13	
STEAM TO P-S TURBINE		JOB NO.	DRAWING NO.	
	12447-033	EB-13-R 921.1		

INSPECTOR AND TESTING RECORD FOR PIPE SUPPORT RESTRAINT

12447-033 10-30-51

12447-033 PP-1 / PP-3 ACC

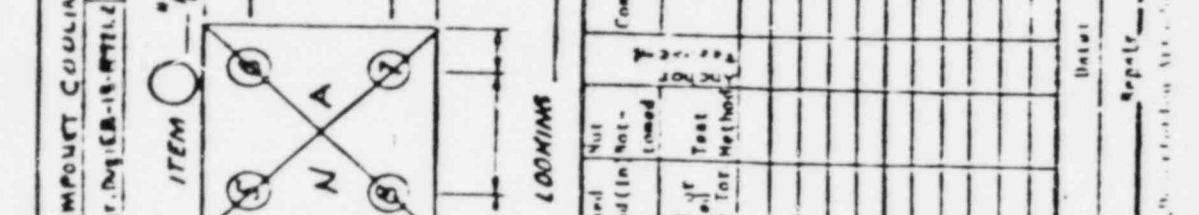
Revised	Comments	By

AS BUILT

Stress Prob: 03569 System: STM TO PARTIAL...
 WSP No: M207 Revit: Ref. Dwg. No: M33' Revis: ISO No: END 7-1
 Area/Room: 3 / COMPONENT COULING
 Installation per Detail Dwg. Yes No
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure Yes No
 If yes, show on sketch Yes No
 No. of Expansion Anchors: 4 Pipe Elevation: 585'-0"
 Measured gap between concrete surface and back of support plate: 0
 Walkdown Inspector: Bob Johnson Date: 11/6/99
 Reviewer: Allen Verbeek Date: 11/6/99

11/6/99 AS BUILT
 OFI Nov 11/6/99

ITEM 3 1/2" A
 ITEM 3 1/2" A
 ITEM 3 1/2" A



Wedge	Shell	Wedge Engag.	Shell Engag.	Bolt Size	Stud Dia.	Stud Project. Length	Stud Length	Embed. Length	Comments
1	R	FULL	FULL	5/8"	1"				
2	R	FULL	FULL	3/8"	1"				
3	R	FULL	FULL	5/8"	3/4"				
4	R	FULL	FULL	5/8"	3/4"				

CONCRETE EXPANSION ANCHOR
 For Major-It Thread (In Nut Not-Toned)
 No. Pins/ Tens. Washer, OK
 No. Spacing Tens. Wash. n/ Plate

Inspection per Detail Dwg. Yes No
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure Yes No
 If yes, show on sketch Yes No
 No. of Expansion Anchors: 4 Pipe Elevation: 585'-0"
 Measured gap between concrete surface and back of support plate: 0

Walkdown Inspector: Bob Johnson Date: 11/6/99
 Reviewer: Allen Verbeek Date: 11/6/99

Inspection Signatures: _____ Date: _____
 Inspected by: _____ Date: _____

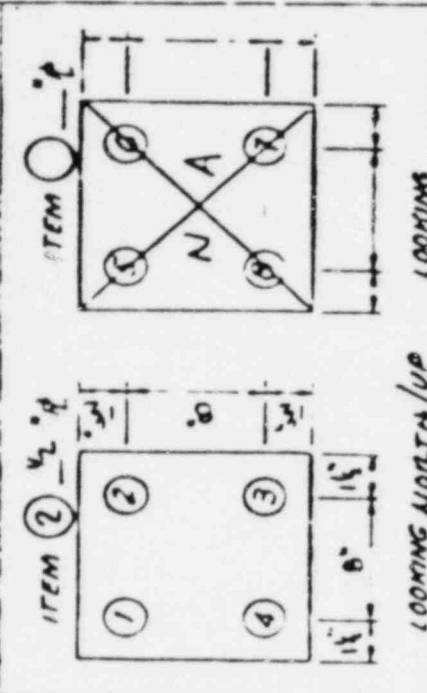
Inspection Signatures: _____ Date: _____
 Inspected by: _____ Date: _____

11/6/99 AS BUILT
 OFI Nov 11/6/99

Stress Prohibitions System: 10/10/85 MIDT AUX Area/Room: 3 / COMPONENT COOLING
 WExp No: M1207 Rev: 1 Ref. Dwg. No: M1207 Rev: 1 150 Notes: 1-1 Rev: 1 Line No: FA-13-1 487.000.00 (M1207) Rev: 1

Installation per Detail Dwg. Yes No
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure Yes No
 If yes, show on sketch Yes No
 No. of Expansion Anchors: 4 Pipe Flange: 85.0"

Measured gap between concrete surface and back of support plate: $\frac{1}{8}$ " GAP
 Valldom Inspector: [Signature] Date: 11/3/85
 Signature: [Signature] Date: 11/3/85



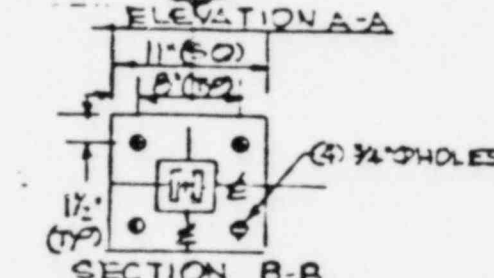
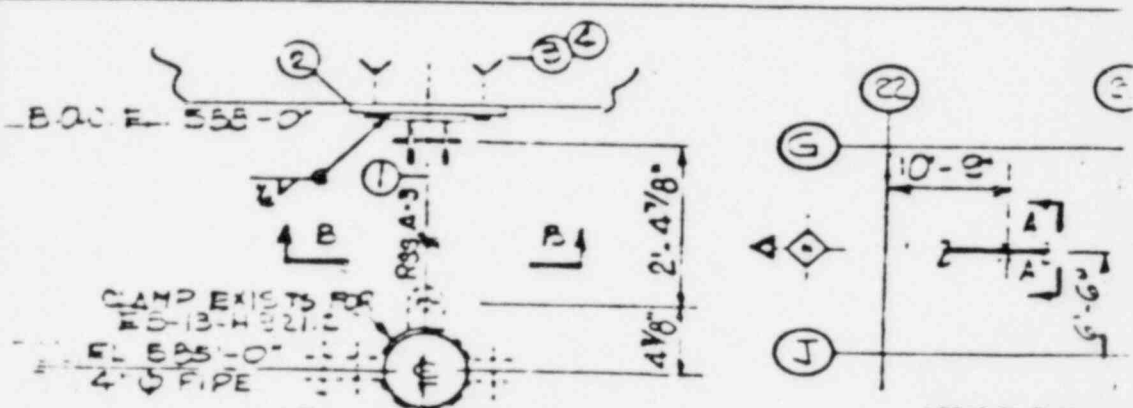
CONCRETE EXPANSION ANCHORS

Wedge No.	J Wedge	R Wedge	Shell	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Failed Length	Comments
1	R	R	R	FULL	3/8"	1"	1"	1"	
2	R	R	R	FULL	3/8"	1"	1"	1"	
3	R	R	R	PARTIAL	3/8"	1"	1"	1"	
4	R	R	R	FULL	3/8"	1"	1"	1"	

Inspector Signature: _____ Date: _____
 Client Signature: _____ Date: _____
 Inspector Signature: _____ Date: _____

Stress Prohib	MPap No. 20	Installation	If no. As-Bul	Evidence n	If yes, show	No. of Repar	Measured gap and back of	Walkdown Ins	Signature	Reviewer	Signature	Wedge	Shell	1	2	3	4	UT Inspector	Disciplines	Engineering
---------------	-------------	--------------	---------------	------------	--------------	--------------	--------------------------	--------------	-----------	----------	-----------	-------	-------	---	---	---	---	--------------	-------------	-------------


QTY	UNIT	DESCRIPTION
1	1	3 RIGID STRUT ASS'Y OVER ALL STRUT LENGTH = 2'-4 7/8"
2	1	4-X 11-X 11" C-3 PLATE
3	2	BY PHILLIPS SHAD-DEE CONC. FAST.
4	4	7/8 X 1/4" TAP-BOLT



FORCE	FY
THERMAL	91
SEE SEISMIC	2106
GRAVITY	-175

LOAD
MARK NO. EB-3-H 921.3

As Built Description

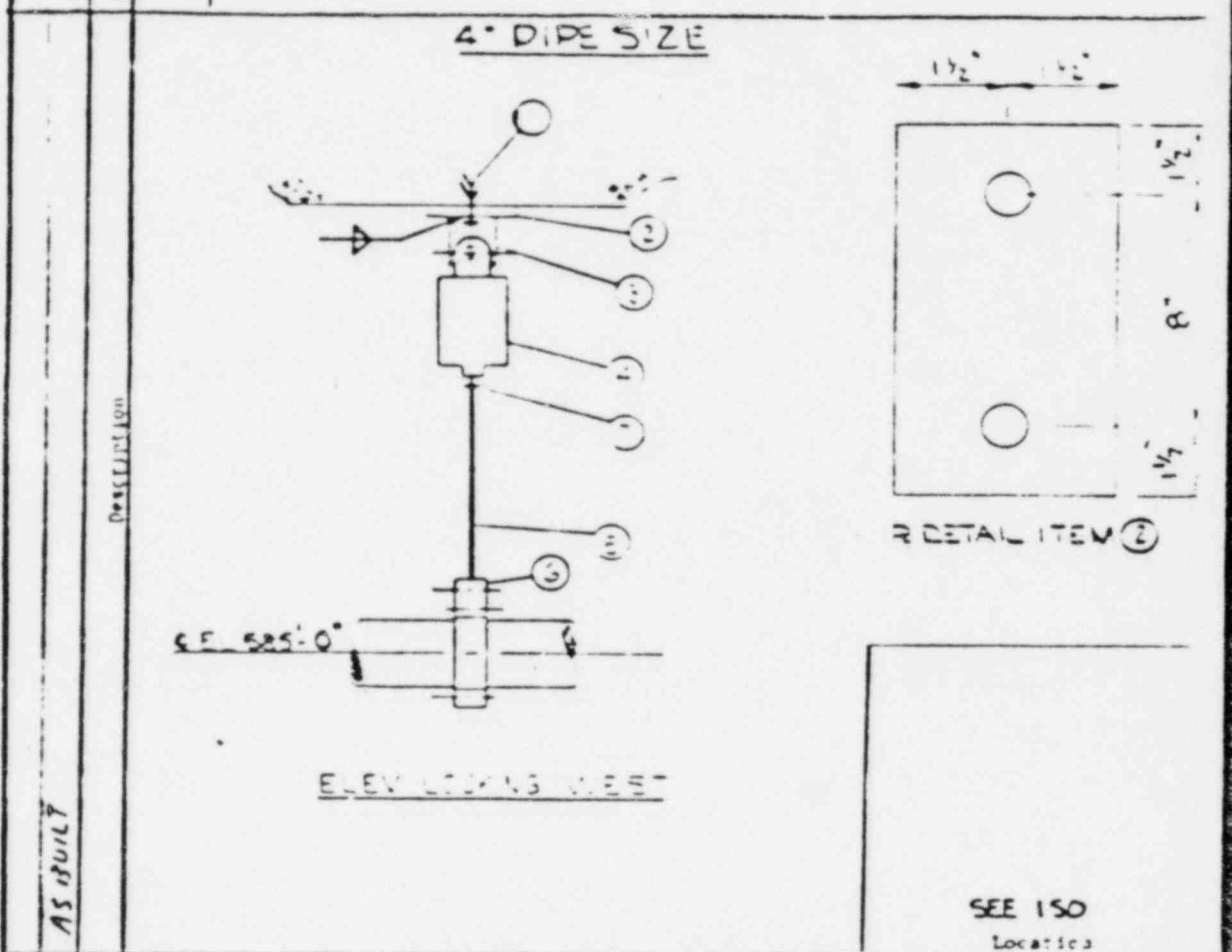
PALISADES PLANT CONSUMERS POWER COMPANY PIPE SUPPORT STEAM TO P-88 TURBINE	 SAN FRANCISCO JOB NO. 12447-033	NO. AAO E60-7-1	RE
		REF. DWGS. M-634-0 STEEL C-104-13	
		DRAWING NO.	1F
		EB-13-R 921.3	

INSPECTION AND TESTING RECORD FOR PIPES, SUPPORT/RESTRAINT 12447-033 C-96 (6)
12447-033 FF-1 / FF-3 Acc

REV	DATE	DESCRIPTION	BY	CHKD

DATE	10/27/79	ASB	DATE	11/14/79
REV.	1	ASB	REV.	1
PROJECT	CONSUMER POWER COMPANY PALISADES	SYSTEM	STEAM TO DBB TURBINE	
LOCATION	CONVERT, MICHIGAN	PLANT AREA/ROW	3 / COMPONENT COOLING	
DESIGN	ASB	PKID	MEXP M207	
ISOMETRIC		ISOMETRIC	AAO - EBD 7-1	
REF. Dwg	M-39	REF. Dwg	M-39	
SUPPORT/RESTRAINT	EB-1-LSO	SUPPORT/RESTRAINT	EB-13-H921.4	

NO.	1	5/8" STD CONCRETE FASTENERS (3 REQD)
NO.	2	R 3/8" x 3" x 11"
NO.	3	WELDING LUG
NO.	4	VS2C - VARIABLE SUPPORT WELD LUG 160.241E.2
NO.	5	5/8" WELDED EYE ROD
NO.	6	4" O.D. SIZE STD 3 BOLT CLAMP
NO.	7	5/8" FULL NUT

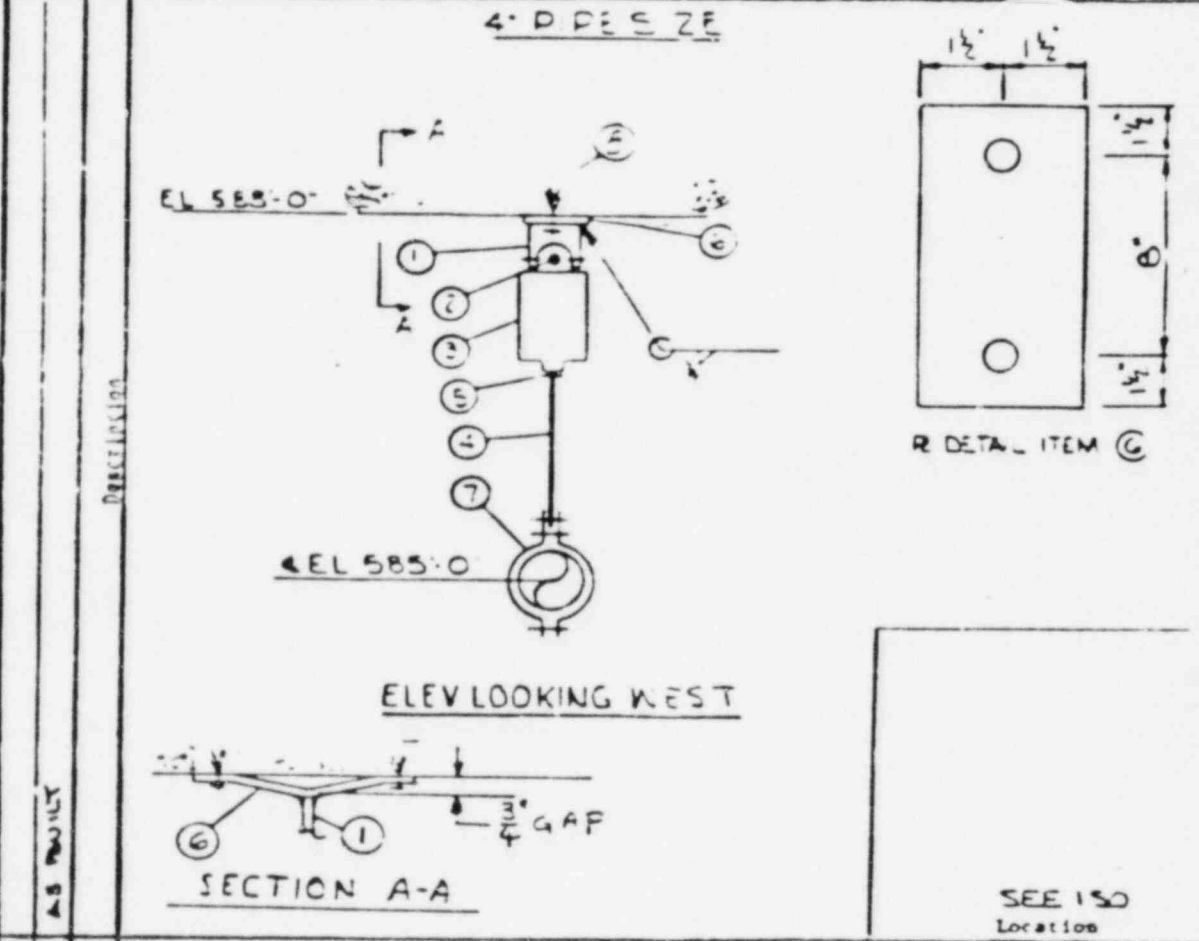


DATE	11/14/79	ASB	DATE	11/14/79
REV.	1	ASB	REV.	1
PROJECT	CONSUMER POWER COMPANY PALISADES	SYSTEM	STEAM TO DBB TURBINE	
LOCATION	CONVERT, MICHIGAN	PLANT AREA/ROW	3 / COMPONENT COOLING	
DESIGN	ASB	PKID	MEXP M207	
ISOMETRIC		ISOMETRIC	AAO - EBD 7-1	
REF. Dwg	M-39	REF. Dwg	M-39	
SUPPORT/RESTRAINT	EB-1-LSO	SUPPORT/RESTRAINT	EB-13-H921.4	

NO.	1	5/8" STD CONCRETE FASTENERS (3 REQD)
NO.	2	R 3/8" x 3" x 11"
NO.	3	WELDING LUG

REV.	DATE	BY	DESCRIPTION
1	11/17/79	AS BUILT	
2	11/7/79	AS BUILT	

- 1 SIZE 4 WELD NUT
- 2 3/8" x 2" LG BOLT & NUT
- 3 V51C 4 YAR SUPT HL 175° CL 175° MVT W/ WEDS SADDL
- 4 1/2" x WELDED EYE EOD = 1'-6" LG
- 5 1/2" x HEX NUT
- 6 R 1/2" x 3" x 11"
- 7 4" DIA SIZE STD 3 BOLT PIPE CLAMP
- 8 1/8" COX. FASTENER W/ 3/8" x 1 1/2" HEX BOL



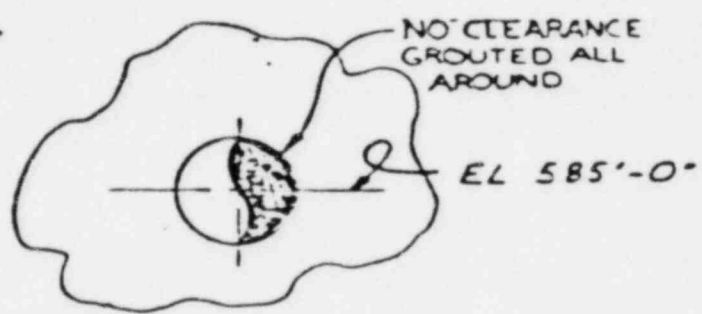
REV.	DATE	BY	DESCRIPTION
1	11/7/79	AS BUILT	
2	11/7/79	AS BUILT	

CONTRACTOR	BECHTEL	SYSTEM	STEAM TO P&B TURBINE
CLIENT	ANNE ARBOR, MICHIGAN	PLANT AREA/ROOM	3 / COMPONENT COOLING
PROJECT	PALISADES PROJECT JOB 12447	PAID	MEXD M207
COMPANY	CONSUMERS POWER COMPANY	ISOMETRIC	AAO-EBD 7-1
LOCATION	PALISADES	REF. Dwg	M-39
	CONYERT, MICHIGAN	SUPPORT/RESTRAINT NO.	EB-13-H922

DATE	11/7/79	BY	AS BUILT
------	---------	----	----------

Stress Prob
 MPSP No. 20
 Installation
 If not, a R
 (volume, of
 If yes, show
 No. of taps
 Measured by
 and back
 Markdown Inc
 Signature
 Revisions
 Signature
 Weight
 Shell
 2
 3
 4
 IT Inspector
 Plant Engineer
 Engineering

Drawn	Checked	Approved	Description



ELEV LOOKING WEST
 EGD 7-1-P2 @ EL 585'-0"

SEE ISO Location

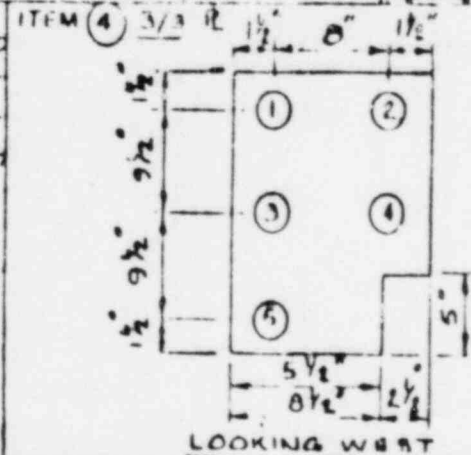
As Built

BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	System: SIM TO PAB TURBINE Plant Area/Room: 3/COMP COOLING PID: MEXP 207
CONSUMERS POWER COMPANY PALISADES	Isometric: AAO E30 7-1 RFP No: M 39

ID	QTY	DESCRIPTION
1	1	4" Ø 3" BOLT PIPE CLAMP G = 3" x 3" x 1/2" (2.000)
2	1	2" Ø STD WST PIPE STAINLESS 304 - 3/16 LB
3	1	3/8" x 4" x 4" C-S PLATE

Stress Probe: **D335B** System: **N/A TURBINE** Side: **TURBINE** Area/Room: **G/ELEV. 570'-0"**
 Exp No: **205** Rev: Ref. Dwg. No: **M-52** Rev: **4** ISO No: **M-11204** Rev: **1** Line No: **1AD-64** Upr. No: **PRD-6-NES** Rev: **1**

Installation per Detail Dwg. Yes No
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure If yes, show on sketch Yes No
 No. of Expansion Anchors: **5** Pipe Elevation: **10'-6"**



Measured gap between concrete surface and back of support plate: **0**
 Walkdown Inspector Signature: *J. D. Smith* Date: **2/11/01**
 Reviewer Signature: *Allen J. ...* Date: **2/11/01**

CONCRETE EXPANSION ANCHOR

Wedge	Bolt No.	J Wedge	Thread Engage.	Stud Dia.	Stud Project.	Stud Length	Wedge Length	Applied	Eng/Thread	No. Time	For Wedge-It Pine/Washer, OK	Exposed Thread (in)	Nut Ant-tomed	Comments
Shell		S Shell	Thread Engage.	Bolt Size	Length S to C	Bolt Length	Wedge Length				Shell Moved or Rotated While In	Test Method		
	1	S	N/A	1/2"	N/A									
	2	S	N/A	1/2"	N/A									
	3	S	N/A	1/2"	N/A									
	4	S	N/A	1/2"	N/A									
	5	S	N/A	1/2"	N/A									

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client: Engineering Evaluation: Acceptable Signature: _____ Date: _____
 Discrepancies Resolved: PCRF Other _____ Final Acceptance Signature: _____ Date: _____

Rev: F1

Comments

Sched

Stress Probe: **D335B**
 Exp No: **205**
 Installation: **As-Built**
 Evidence of Concrete Cracking or Failure: **No**
 No. of Expansion Anchors: **5**
 Measured gap between concrete surface and back of support plate: **0**
 Walkdown Inspector Signature: *J. D. Smith*
 Reviewer Signature: *Allen J. ...*

Wedge: **5**
 Shell: **5**
 UT Inspector: **1**
 Discrepancies: **0**

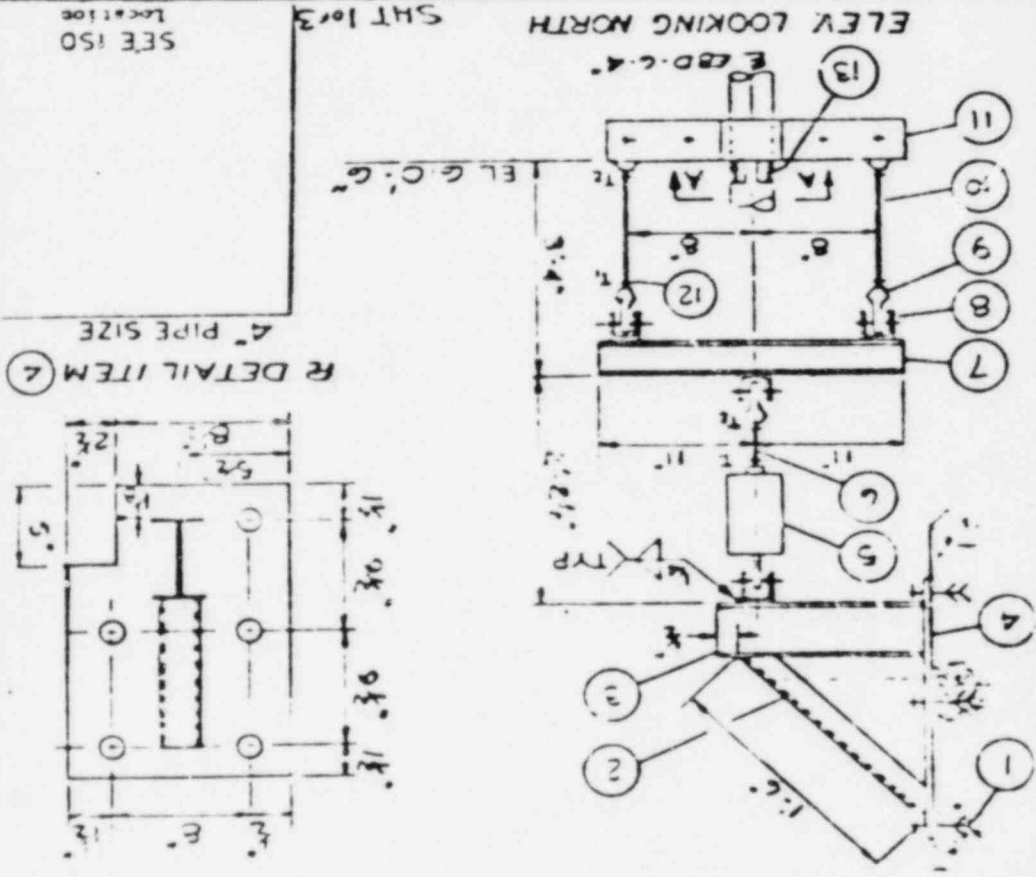
PPE SUPPORT - AUX BLDG
 STM TO P B TURBINE
 12447
 EBD-7-H1
 C 107-2122

Qty	Material	Description	Rev.	Date	Appr.
1	3/8 CONC FASTENERS (5 REQ'D)				
2	2X50" X 1'-0" LG				
3	4X200" X 1'-2" LG				
4	4 R 3/8" X 1'-10"				
5	GUINNEL VAR SUP PG B 28 TPE B, SIZE NO NOTED				
6	LEAD 975% TPE 1/2"				
7	HANGER ROD 3/8" X 10' LG, TPE 1/2"				
8					
9					
10					
11					
12					
13					

Rev.	Description
1	3/8 CONC FASTENERS (5 REQ'D)
2	2X50" X 1'-0" LG
3	4X200" X 1'-2" LG
4	4 R 3/8" X 1'-10"
5	GUINNEL VAR SUP PG B 28 TPE B, SIZE NO NOTED
6	LEAD 975% TPE 1/2"
7	HANGER ROD 3/8" X 10' LG, TPE 1/2"

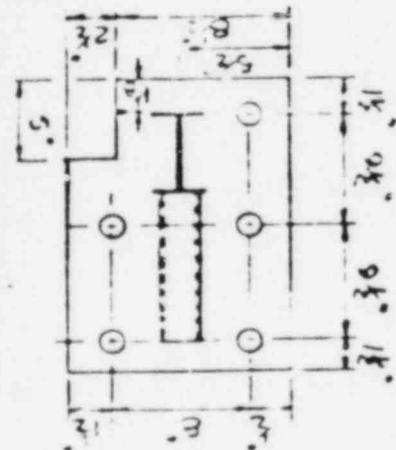
Rev.	Date	Appr.	Description
AS BUILT	2780	OFI	

System	Plant Area/Inlet	PAID	Isometric	Ref. Dwg	Support/Reference No
AUX TURBINE	3/COMP COOK	MEXP M205	M01-EBD-6-1	M-52	EBD-6-H23



SEE ISO
LOCATION

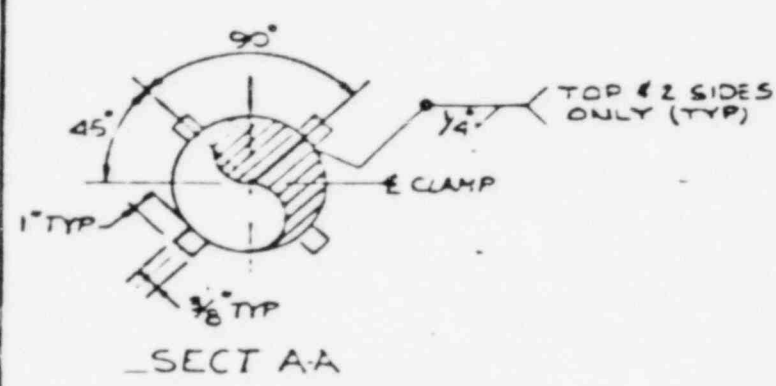
R DETAIL ITEM 7
4" PIPE SIZE



OVER-ALL STRUT LENGTH 115.5"
 EBD-7-H1

Stress Profile	UT Inspector
Weld No. MA 70	Blowmarks
Installation	
If no, As-Built	
Evidence of	
If yes, show	
No. of Tapes	
Measured Gap and back of	
Walkdown Insp	
Signature	
Reviewer	
Signature	
Wedge	
Shell	

REV	DESCRIPTION
7	W 4 X 130 X 1/10 LG
8	WELDED BEAM ATTACHMENT SIZE 6 EP #113 (4 REQ'D)
9	WELDLESS EYE NUT SIZE 6 EP #274 (5 REQ'D)
10	HANGER ROD 3/4" X 2'-10" LG, T ₁ = 4 1/2", T ₂ = 4 1/2" (2 REQ'D)
11	RISER PIPE CLAMP (SEE SHT #3)
12	3/4" Ø HEX NUT (6 REQ'D)
13	3/8" X 1" X 2" LUG (4 REQ'D)



AS BUILT	Description	PIPE SIZE
		SEE ISO Location
SHT 2003		

REV	DATE	BY	DESCRIPTION	SYSTEM
OFI	2-7-80		BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	AUX TURBINE
			CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	Plant Area/Room: 3/COMP COOL P&ID: MEXP H 205 Isometric: MIW-EBD-6-1 Ref. Dwg: M52 Support/Restraint No: EBD-6-H23

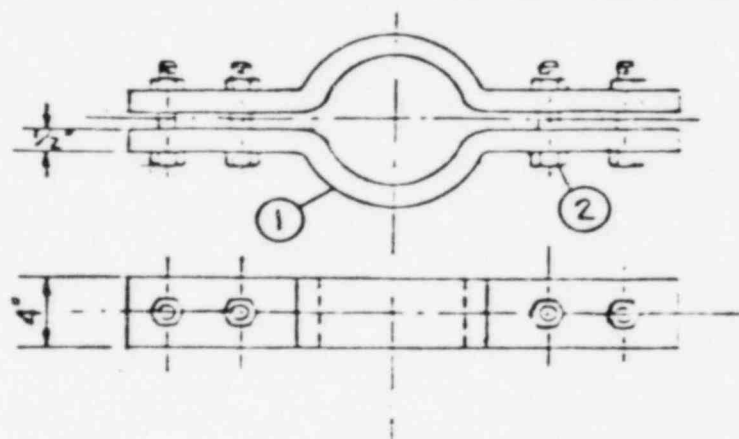
NO. OF REVISE	COMMENTS	DATE	BY

INSPECTION AND TESTING RECORD FOR PIPE SUPPORT, RESTRAINT

CONSUMERS POWER COMPANY	DATE	C-107-12-12
PIPE SUPPORT - AUX BLDG	CEN	DRAWING
STM TO P-8B TURBINE	12447-033	EBD-7 H2 /

APPROVED	DATE	
DESIGNED	DATE	
CHECKED	DATE	

4" PIPE CLAMP HANGER PART NO. 370 TYPE 1
 3/8" X 1/2" HEX HD BOLTS/NUTS (4 REQ -)



HANGER CLAMP
DETAILS
 PART NO. 370 TYPE 1

AS BUILT	DESCRIPTION	
	ISO.	SH30F3
		Location

DATE	BY	DESCRIPTION
2-7-80		BECHTEL AEG ARBOR, MICHIGAN PALISADES PROJECT JOB 12447
07/1		CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN
		System: AUX TURBINE Plant Area/Room: 3/COMP COOL PAID: H205 Isometric: M101-EBD-6-1 Ref. Dwg: M52 Support/Issued To: EBD-6-H23

REV	DATE	DESCRIPTION
1		# 3 YELDED PINS RETAINMENT OF IS
2		# 3 YELDED PINS RETAINMENT OF IS
3		3/8" X 1/2" HEX NUTS

CONSUMERS POWER COMPANY
 PIPE SUPPORT - AUX. E.D.G.
 STM. TO P.E. TURENS

REC
 12447
 C38

DRAWING
 EED-7-R3

No. 05338
 Aux. YURBANE
 No. 205
 Rev. M-39
 Installation per detail No. Yes No
 All As-Built Nos. Complete Yes No
 Evidence of Concrete Cracking or Splice Flow No Yes
 If you, show on sketch No Yes
 No. of Expansion Anchors 4
 Measured gap between concrete surface and back of support plate NONE

Val'son Inspector
 Signature: *J. M. [Signature]* Date: 7/10/50
 Reviewer
 Signature: *William [Signature]* Date: 7/12/50

Stud No.	3/8" Bolt-11	Thread Engage.	Stud Info.	Stud Project.	Stud Length	Stud Type
1	3	N.A.	5/8"	N.A.	N.A.	Flow
2	3	N.A.	5/8"	N.A.	N.A.	Flow
3	3	N.A.	5/8"	N.A.	N.A.	Flow
4	3	N.A.	5/8"	N.A.	N.A.	Flow

Inspector Signature: _____ Date: _____
 Other: _____

011 11/19
11/19

FRISCHES PLANT
CONSUMERS POWER COMI



REF: EED-7-41
M-39-2
C-107-12807

PIPESUPPORT AUX B.D.G

SENT
12/27/71
033

DRAWING

SIM TO P-85 TURENE

EED-7-41

7
Stress Prob: 03558 System: AUX TURBINE
Rep No: 205 Rev: 1 Ref. Inv. No: 38 Rev. 23/10/71

Installation per Detail Inv. Yes No
If no, As-Built Inv. Complete Yes No
Evidence of Concrete Cracking or Failure
If yes, show on sketch Yes No
No. of Expansion Anchors: 2 Elevation: 60' 6"

Measured gap between concrete surface and back of support plate: N/A

Walkdown Inspector Signature: J. M. Schuler Date: 2/14/72
Reviewer Signature: G. J. Schuler Date: 2/14/72

Wedge	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

UT Inspector Signature: _____ Date: _____
Discrepancy (Circle) Yes/No Reported to Client
Engineering Evaluation: Acceptable Signature: _____
DISCREPANCIES NOTIFIED: FCM Other: _____

N/A

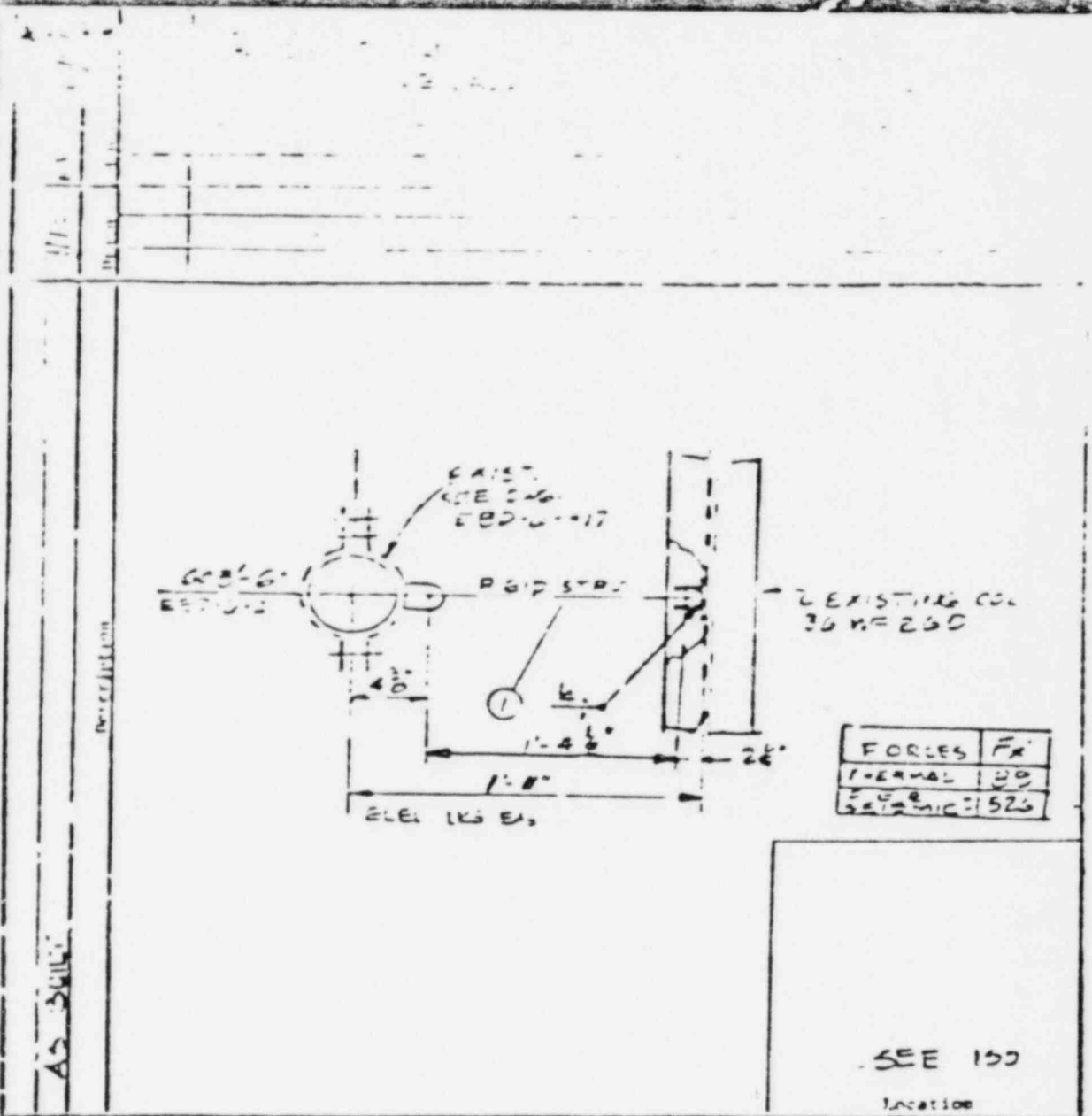
N/A

1/24/72

X

Stress Profile
 Map No. M 20
 Installation
 If no, As-Built
 Evidence of
 If yes, show
 No. of Pages
 Measured gap
 and back of
 Walkdown Inspec
 Signature
 Reviewer
 Signature

Material
 Quantity
 Date
 Signature
 Title



QF1 10/22/70	REV. DATE	BECHTEL ANN ARBOR, MICHIGAN	System: AUX. TURBINE
		PALISADES PROJECT JOB 12447	Plant Area/Room: G | ELEV. 530'-0"
		CONSOLIDATED POWER COMPANY PALISADES	PAID: 205
		COVER, MICHIGAN	Isometric: M 101-EBD-6-1
			Ref. Dwg: M-58
			Support/Restraint No: EBD-6-H 32

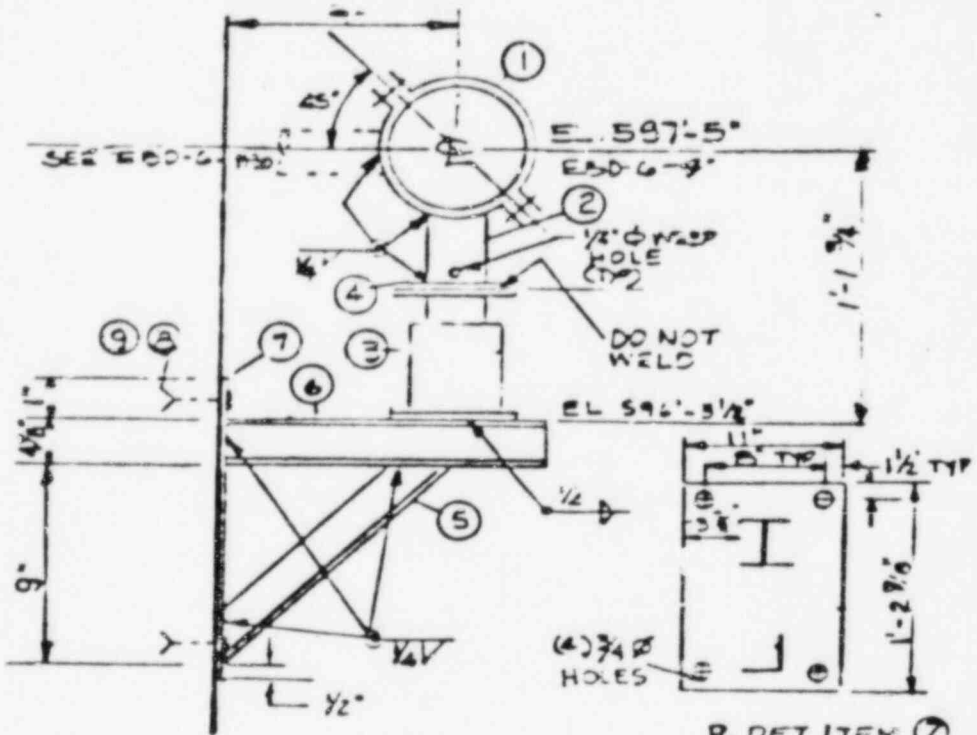
4	HZ/REV/JL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
---	-----------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

LE-47-033 FT-1 / FP-3

UNACCEPTABLE DESCRIPTION ATTACHED

Stress Profile	
WPAP No: M20	
Installation	
II no, Ag-Rul	
Evidence of C	
If yes, show	
No. of Repairs	
Measured gap b	
and back of	
Valheim Inspec	
Signature	
Reviewer	
Signature	
Wedge	
Shell	
Inspector	
Report No	
Date	

1	3/8" X 1" X 2" CS PLATE
2	1/2" X 1" X 2" ALUMINUM ANGLE
3	2" X 1" X 1/2" BEAM
4	3/8" X 1" X 1" 2 7/8 CS PLATE
5	2" X 2" PHILLIPS SLAB SEE CONCRETE
6	1/2" X 1" 7/8 TAP BOLT (4 REQ)



AS BUILT

REV	DATE	RECHTEL AND ARBOR, MICHIGAN	System: AUX TURBINE
		PALISADES PROJECT JOB 12447	Plant Area/Room: G/ELEV 590'-5"
OFF	REV	CONSUMERS POWER COMPANY PALISADES	PAID: 105
		COVER, MICHIGAN	Isometric: M101-EBD-6-1
			Ref. Dwg: M-53
			Support/Restraint No: EBD-6-116

R DET ITEM ⑦
SEE 150
Location

INSPECTION AND TESTING REQUIRED FOR PIPESUPPORT RESTRAINT

DATE	BY	CHKD
11/11/71	2	

11/6/71
Date

CONSUMERS POWER COMPANY
 PIPE SUPPORT
 STEEL TO P-63 TURBINE

REC'D
 M-634-0
 C-104-13

DRWG NO
 EB-13-R921.3

INSPECTION AND TESTING BLOCK FOR PIPE SUPPORT RESTRAINT

Project: 03358 System: AUX. TURBINE MIDDLE TURBINE Area/Room: 6/ELEV. 590'-0"
 Unit: 209 Rev: 1 Ref. Des. No. M-55 Rev: 18 ISO No. MID-ENDB 590'-0"
 Line No. ERD-04 Rev. No. HIG

Insulation per Detail (DR) Yes No
 Any As-Built Dev. Complete Yes No
 Presence of Concrete Cracking or Failure Yes No
 How in sketch Yes No
 Foundation Anchors: A 1/2" Pipe Elevation: 591'-5"

Concrete gap between concrete surface and back of support plate: 0

Inspection Inspector: P.M. McArthur Date: 2/4/68
 Signature: C. J. Lebeck Date: 2/4/68

1/2" 8" 1/2" 1/2" 7/8" 1/2" 1/2" 1/2"

ITEM 7 8/8" ITEM 8

LOOKING WEST

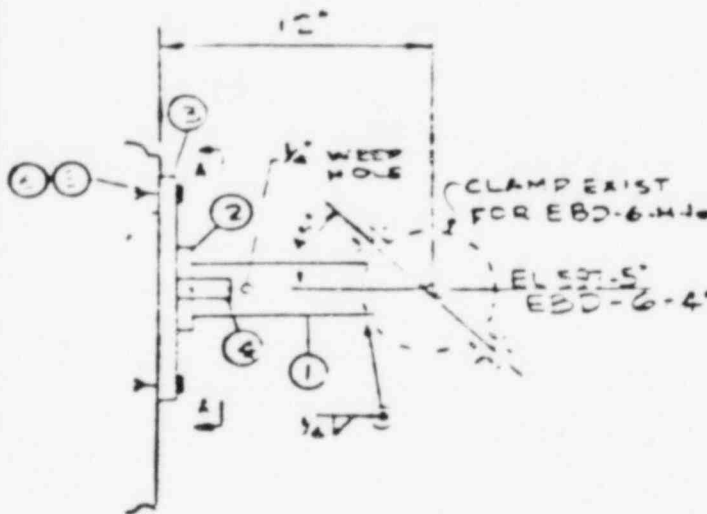
No.	Flange	Shell	Thread Engage.	Stud Dia.	Stud Project. Length	Stud Length	Stud Length	Label Length	Weld Length	For Welding	No. Flange Wishes	No. Flange Wishes	No. Flange Wishes	Exposed Thread (in)	Not Insured	Comments
1	3		N/A	5/8"	N/A											
2	3		N/A	5/8"	N/A											
3	5		N/A	5/8"	N/A											
4	5		N/A	5/8"	N/A											

Inspector Signature: _____ Date: _____
 Client Signature: _____ Date: _____
 Rejected to Client Rejected to Client
 Rejected to Client Rejected to Client

W N - 1
 12" x 4" x 11 3/4" x 1 1/2"
 12" x 12" x 2'-0" x 1/2" (2 RED D)
 12" x 12" x 2'-0" x 1/2" (2 RED D)

DATE	11/87	REV.	1	AS BUILT
PROJECT	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	
LOCATION	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	
DESCRIPTION	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	

DATE	11/87	REV.	1	AS BUILT
PROJECT	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	
LOCATION	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	
DESCRIPTION	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	



FORCES	F2
DISE	1188
THERMAL	100°

ELEV LKG NORTH

SHT 1 OF 2

SEE 150
Location

DATE	11/179	REV.	1	AS BUILT
PROJECT	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	
LOCATION	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	
DESCRIPTION	CONSUMERS POWER COMPANY PALISADES		CONSUMERS POWER COMPANY PALISADES	
SYSTEM	AUX TURBINE		AUX TURBINE	
PLANT AREA	ELEV 590		ELEV 590	
PAID	205		205	
ISOMETRIC	M101-EBD-6-1		M101-EBD-6-1	
REF. Dwg	M-53		M-53	
SUPPORT/RESTRAINT	EBD-6-H-30		EBD-6-H-30	

NO.	1	DESCRIPTION	1/2" WEEP HOLE BEAM ATTACHMENT #1188
NO.	2	DESCRIPTION	#5 VARIABLE SUPPORT TIE R 1/2" 231° SPIN
NO.	3	DESCRIPTION	CLAMP EXIST FOR EBD-6-H-10

INSPECTION AND TESTING RECORD FOR PILE/SUPPORT RESTRAINT

Project No: **05358** System: **AUX. TURBINE** Bridge: **TURBINE** Area/Room: **6/BLDV. 590-0**
 Drawing No: **205** Rev: **1** Ref. Des. No: **M-55** Rev: **3** ISO No: **M01840** Rev: **6** File No: **EBD-6-4** Rev: **1** Per. No: **EBD-6-4** Rev: **1**

Installation per Detail Draw. Yes No
 All Studs Fully Engaged. Yes No
 Evidence of Concrete Cracking or Failure. Yes No
 If Yes, show on sketch. Yes No
 Location of Connection Anchors: **A** $\frac{1}{2}$ " from elevation. **591-5**
 Location of connection between concrete surface and back of support plates.

Inspection Inspector: **J. A. ...** Date: **...**
 Signature: **Allen ...** Date: **...**

CONCRETE PREPARED BY: **...**

Item No.	Location	Thread Engage.	Thread Engage.	Stud Dia.	Stud Length Project.	Stud Length	Stud Length	Embed. Length	Comments
1	...	N/A	N/A	2 1/8"	...	...	...	...	...
2	...	N/A	N/A	1 1/8"	...	...	...	...	...
3	...	N/A	N/A	1 1/8"	...	...	...	...	...
4	...	N/A	N/A	1 1/8"	...	...	...	...	...

Looking WEST:

Looking EAST:

Testing Inspector Signature: _____ Date: _____
 Client Signature: _____ Date: _____

INSPECTION AND TESTING RECORD FOR PILE/SUPPORT RESTRAINT

Project No: **...** System: **...** Bridge: **...** Area/Room: **...**
 Drawing No: **...** Rev: **...** Ref. Des. No: **...** Rev: **...** ISO No: **...** Rev: **...** File No: **...** Rev: **...** Per. No: **...** Rev: **...**

Installation per Detail Draw. Yes No
 All Studs Fully Engaged. Yes No
 Evidence of Concrete Cracking or Failure. Yes No
 If Yes, show on sketch. Yes No
 Location of Connection Anchors: **...** $\frac{1}{2}$ " from elevation. **...**
 Location of connection between concrete surface and back of support plates.

Inspection Inspector: **...** Date: **...**
 Signature: **...** Date: **...**

CONCRETE PREPARED BY: **...**

Item No.	Location	Thread Engage.	Thread Engage.	Stud Dia.	Stud Length Project.	Stud Length	Stud Length	Embed. Length	Comments
1
2
3
4

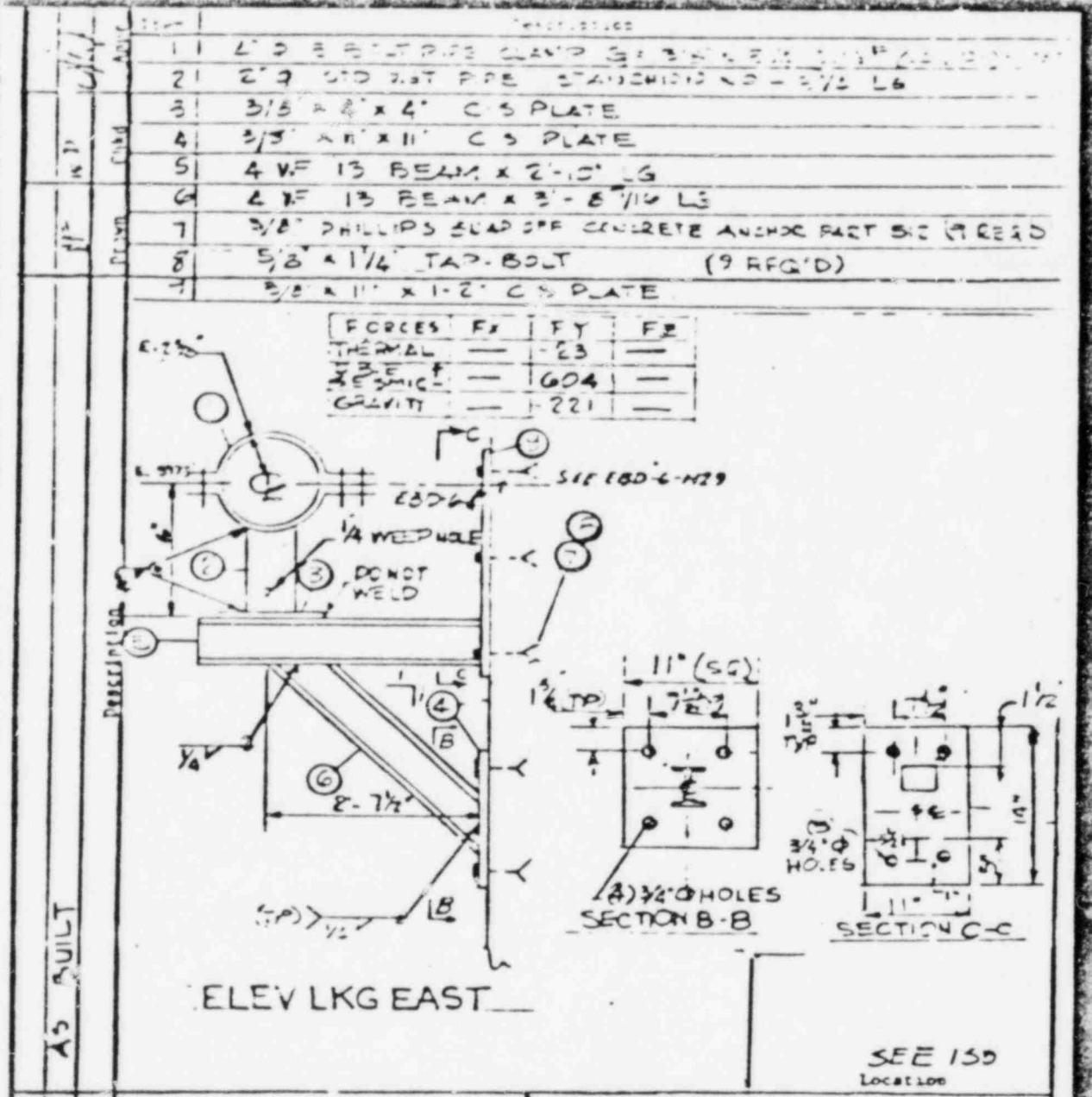
Looking WEST:

Looking EAST:

Testing Inspector Signature: _____ Date: _____
 Client Signature: _____ Date: _____

REV. DATE	BY	DESCRIPTION
01/15	W.P.	ISSUE
01/15	W.P.	REVISED

BECHTEL ANN ARBOR, MICHIGAN	System: STM TO DBB TURBINE
PALISADES PROJECT JOB 12447	Plant Area/Room: 6/COMP ROOM 6
CONDENSER POWER COMPANY PALISADES	PAID: MEXD 207
	Isometric: AAC ESD 7-1
	Ref. Dwg: M 53



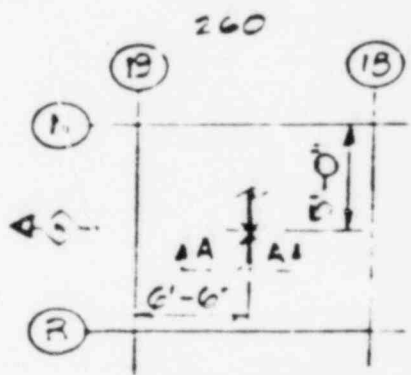
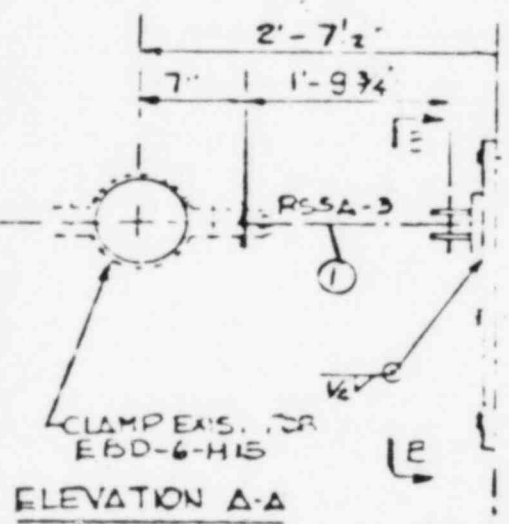
REV. DATE	BY	DESCRIPTION
01/17	AS BUILT	AS BUILT

BECHTEL ANN ARBOR, MICHIGAN	System: AUR TURBINE
PALISADES PROJECT JOB 12447	Plant Area/Room: 6/ ELEV 590-0
CONDENSER POWER COMPANY PALISADES	PAID: 205
COVERT, MICHIGAN	Isometric: M101-EBD-6-1
	Ref. Dwg: M 53
	Support/Restraint No: EBD-6-H15

INSPECTION AND TESTING REQUIRED FOR PALISADES PROJECT	DATE	BY

PALISADES PROJECT JOB NO. 12462033		THIS SHEET NO. 29	
CONTRACTOR	CONSUMERS POWER COMPANY	DESIGNER	M. J. EBD-6-1
PROJECT	PALISADES	SCALE	AS SHOWN
CLIENT	STATE OF NEW YORK	SUPPLEMENTARY SHEET NO.	EBD-6-H29

OVER-ALL STRUT LENGTH ELEMENT



DEFLECTION	FORCES	FX
	D.B.E.	+
	SEISMIC	-
	THERMAL	-
		1204
		-26

SECTION B-B

APPROVED FOR CONSTRUCTION

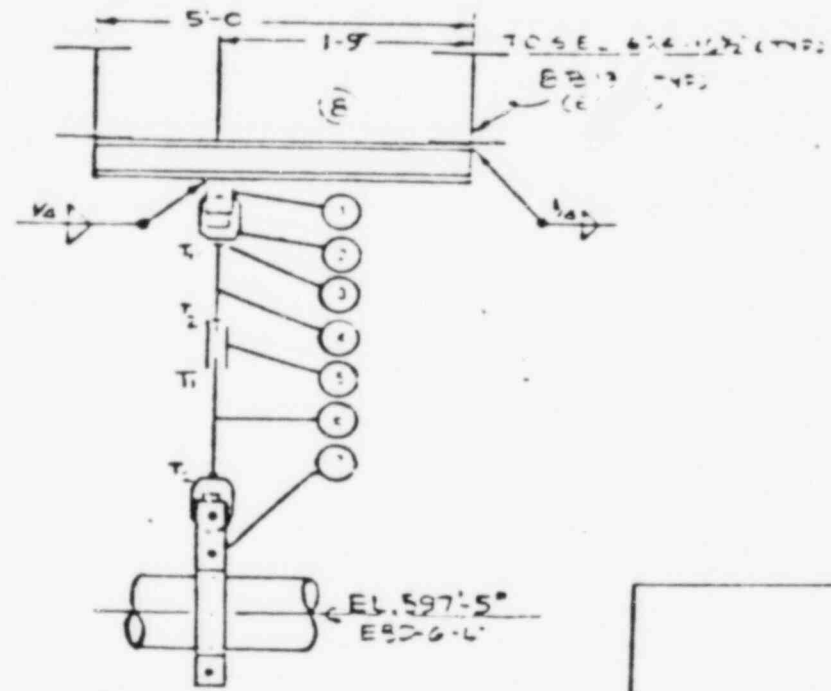
DATE	11/11/71	BY	EBD-6-1
PROJECT	PALISADES PLANT	REF. DESIGNS	EBD-6-1 MSB-13
CLIENT	CONSUMERS POWER COMPANY	JOB NO.	12462033
DESCRIPTION	TURBINE SLIDE	DRAWING NO.	EBD-6-H29
REVISIONS	TEAM TO P-88 TURBINE	REV.	0

INSPECTION AND TESTING RECORD FOR PIPES, SUPPORT, RESTRAINT

NO.	DATE	BY	REMARKS	STATUS
1				
2				
3				
4				
5				

REV. DATE	NO. APPRO. MICHIGAN PALISADES PROJECT JOB 12447	DATE: 3/1/68	COMP. CODE
011	CONSUMERS POWER COMPANY PALISADES	PAID: H 205	
		ISOMETRIC: M101-EBD-6-1	
		REF. Dwg: M-53	
			EBD-6-H23

REV. DATE	NO.	DESCRIPTION
WFO	1	1/2" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132
WFO	2	1/2" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132
WFO	3	5/8" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132
WFO	4	3/4" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132
WFO	5	3/4" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132
WFO	6	3/4" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132
WFO	7	1/2" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132
WFO	8	1/2" x 1/2" x 1/2" W/ T. 2 & T. 2 EP 132



REVISION

AS BUILT

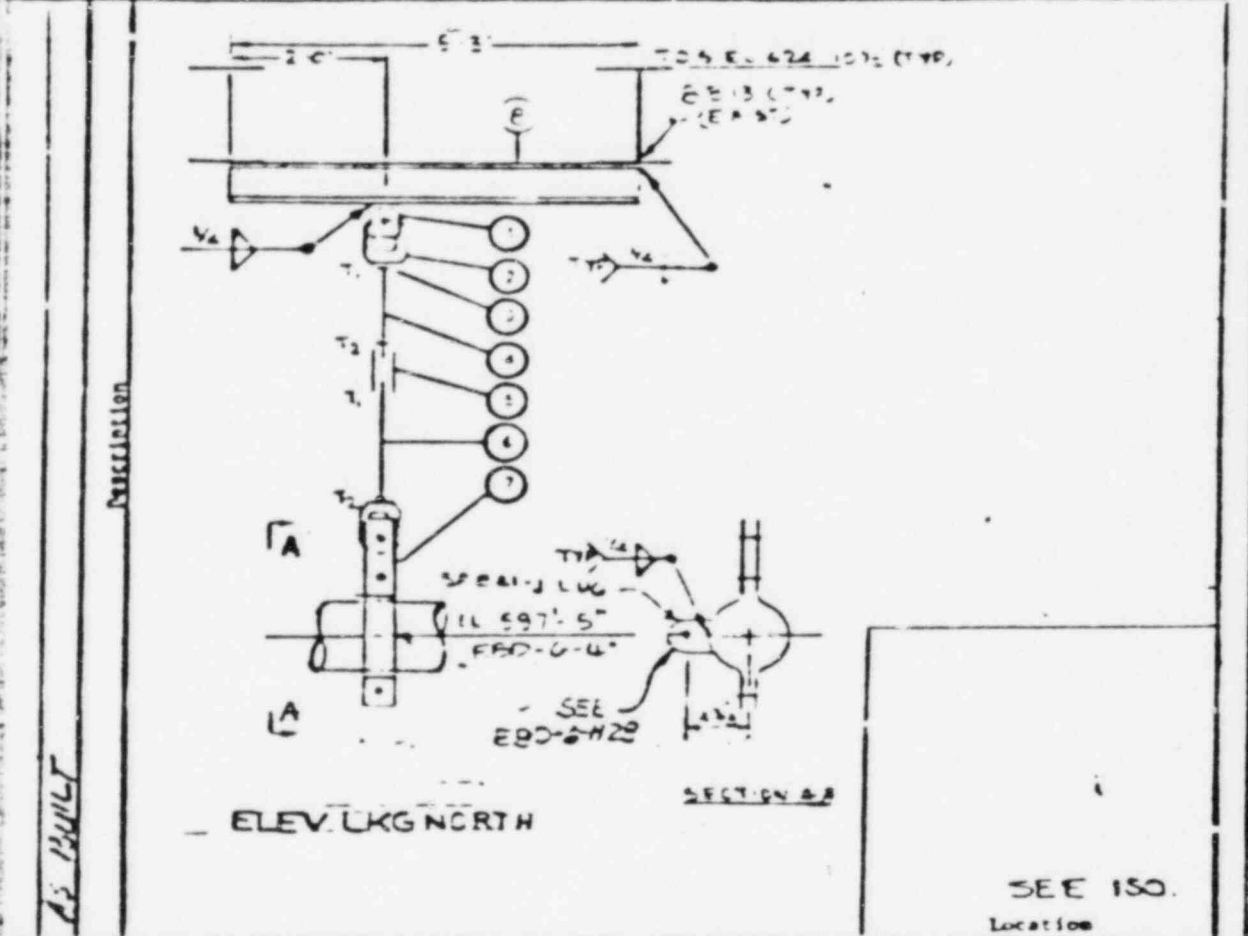
SFF 150
Location

REV. DATE	NO.	DESCRIPTION
OFI 11-1-77	1	RECENT ANS ARBOR, MICHIGAN PALISADES PROJECT JOB 12447
OFI 11-1-77	2	CONSUMERS POWER COMPANY PALISADES
		System: LUK. TURBINE
		Plant Area/Room: 6/ELEV 592-0
		PAID: 205
		Isometric: M101-EBD-6-1
		Ref. Dwg: M-53
		Support/Restraint: EBD-6-NH

Discrepancies Resolved: FCBP Other Final Acceptance Signature: Detail

10' 0000
 2005
 low ceiling per
 100% As built
 volume of concrete
 11. show show up
 12. of expansion
 measured map before
 and back of map
 13. low temperature
 14. concrete
 15. concrete
 16. concrete
 17. concrete
 18. concrete
 19. concrete
 20. concrete
 21. concrete
 22. concrete
 23. concrete
 24. concrete
 25. concrete
 26. concrete
 27. concrete
 28. concrete
 29. concrete
 30. concrete
 31. concrete
 32. concrete
 33. concrete
 34. concrete
 35. concrete
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 37. concrete
 38. concrete
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 96. concrete
 97. concrete
 98. concrete
 99. concrete
 100. concrete

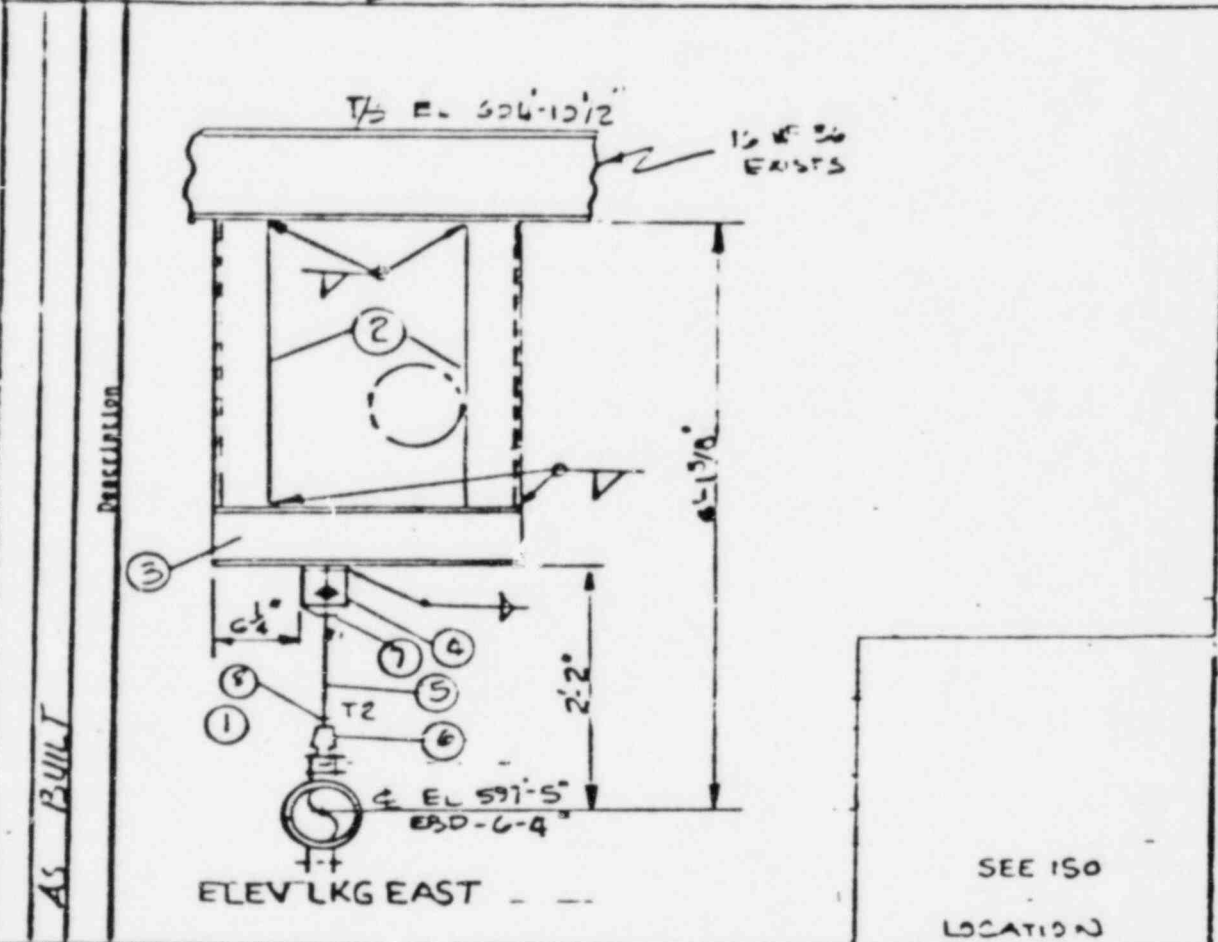
NO	DESCRIPTION	QTY	UNIT
1	1/2" X 12" X 12" REBAR	1	PC
2	1/2" X 12" X 12" REBAR	1	PC
3	1/2" X 12" X 12" REBAR	1	PC
4	5/8" X 12" X 12" REBAR	1	PC
5	5/8" X 12" X 12" REBAR	1	PC
6	5/8" X 12" X 12" REBAR	1	PC
7	5/8" X 12" X 12" REBAR	1	PC
8	5/8" X 12" X 12" REBAR	1	PC



DATE 01/10/77 AS BUILT	BECHTEL ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	SYSTEM: AUX TURBINE Plant Area/Room: G/ELEV. 590'-0" PAID: 205 Isometric: M101-FBD-G-1 Ref. Dwg: M-53 Support/Accessories No: FBD-G-H13
REV. 01/10/77 AS BUILT	CONSUMERS POWER CO INC PALISADES	

REVISIONS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	DATE 01/10/77 AS BUILT
--	---------------------------

REV	DATE	DESCRIPTION
1		4" P. TEE SET PIPE CLAMP
2		L 2" X 2" X 3/16" X 3.712 LG (2 REQ'D)
3		W 4 X 1/2" 2-3/4" LG
4		SIZE 5 WELDED PEAH ATTACHMENT
5		5/8" TREADED ROD 1-3" LG 1/2" LHT 1/2" LHT
6		SIZE 5 WELDLESS EYE NUT
7		SIZE 5 WELDLESS EYE NUT U/L H/T
8		5/8" HEX NUT



REV	DATE	DESCRIPTION	System
1		BECHTEL AND ARBOR, HIGH GAIN	AUX TURBINE
2		PALISADES PROJECT JLS 12447	Plant Area/Room: G/ELEV 590'-0"
3		CONSIDERS POWER CO. PART PALISADES	PAID: - 205
4		CONCEPT, HIGH GAIN	Isometric: MID1-EBD-6-1
			Ref. Dwg: M-53
			Support/Restraint No: EBD-6-H12

- 1 PART 0253 4" SET CLAMP 4" X 2" W/ LOCK NUT MATICS W/ EYE
- 2 PART 0271 PISTON ROD CONN W/ 8" X 1-2" (STD 2407)
- 3 PART 0254 6" STROKE W/ CORE COIL POSITION SETTING (STD 2407)

OF 11-1-7

Rev. Date
AN ARBOR, MICHIGAN
PALISADES PROJECT JOB 12447
CONSUMERS POWER COMPANY
PALISADES

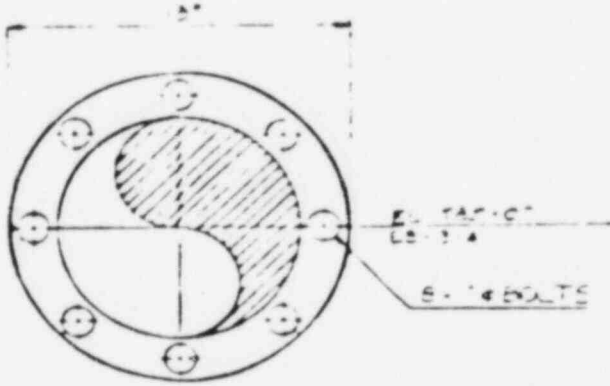
System: STEAM TOP-88 TURBINE
Plant Area/Room: 6/TURBINE
PAID: M-207
Isometric: M-10-EBD-6-1
Ref. Dwg: M-52
Support/Restraint No: M-101-EBD-6-1-P2

49

I.C. W/P/D

DATE

Description



PENETRATION DET.
LOOKING NORTH

(FLANGE BUTTING
AGAINST CONC. WALL)

SEE ISO

Location

OF 5-1

AS BUILT

DATE

BECHTEL
ANN ARBOR, MICHIGAN
PALISADES PROJECT JOB 12447

CONSUMERS POWER COMPANY
PALISADES
COVERT, MICHIGAN

System: STEAM TOP-88 TURBINE
Plant Area/Room: 6/TURBINE
PAID: M-207
Isometric: M-10-EBD-6-1
Ref. Dwg: M-52
Support/Restraint No: M-101-EBD-6-1-P2



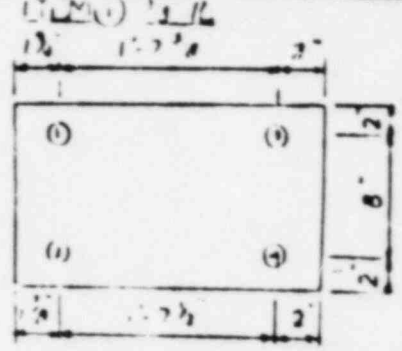
UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION 1
631 PARK AVENUE
NEW YORK, N.Y. 10021

TERC

Stress Prob: 0358 System: 2-28 TURBINE Side: TURBINE 1/10 Room: 6/TURBINE
 Exp No: M-207 Rev: 1 Ref. Des. No: M-52 Rev: 6 ISO No: M-400-1 Rev: 2 Line No: 50-3-4 Ref. Des. No: 50-3-4 Rev: 1

Installation per Detail Des. Yes No X
 If no, As-Built Des. Complete Yes No
 Evidence of Concrete Cracking or Failure
 1" yes, show on sketch Yes No A
 No. of Expansion Anchors: 4 Pipe Elevation: 585'-0"

Measured gap between concrete surface
 and back of support plate: 0"
 Walkdown Inspector
 Signature: Thomas P. ... Date: 11-24-79
 Reviewer
 Signature: Alvin ... Date: 3/12/82



CONCRETE EXPANSION ANCHOR

Wedge	Bolt No. (Per Sketch)	J or R	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Applied Load/Ten.	Case/Anchor	No. Tens.	For use with Pins/Fisher, etc.	Impress Thread (in)	Nut Rot-tomed	Test Method	Comments
Shell		S	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length				No. Spacing back of plate	Shell removed or not used while test			
	1	R		FULL	3/8"	4 1/2"										
	2	R		FULL	3/8"	4 1/2"										
	3	R		FULL	3/8"	4 1/2"										
	4	R		FULL	3/8"	4 1/2"										

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: Incomplete _____ Repair _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Inacceptable, Description Attached _____
 Discrepancies Resolved: FCN _____ Other _____ Final Acceptance Signature: _____ Date: _____

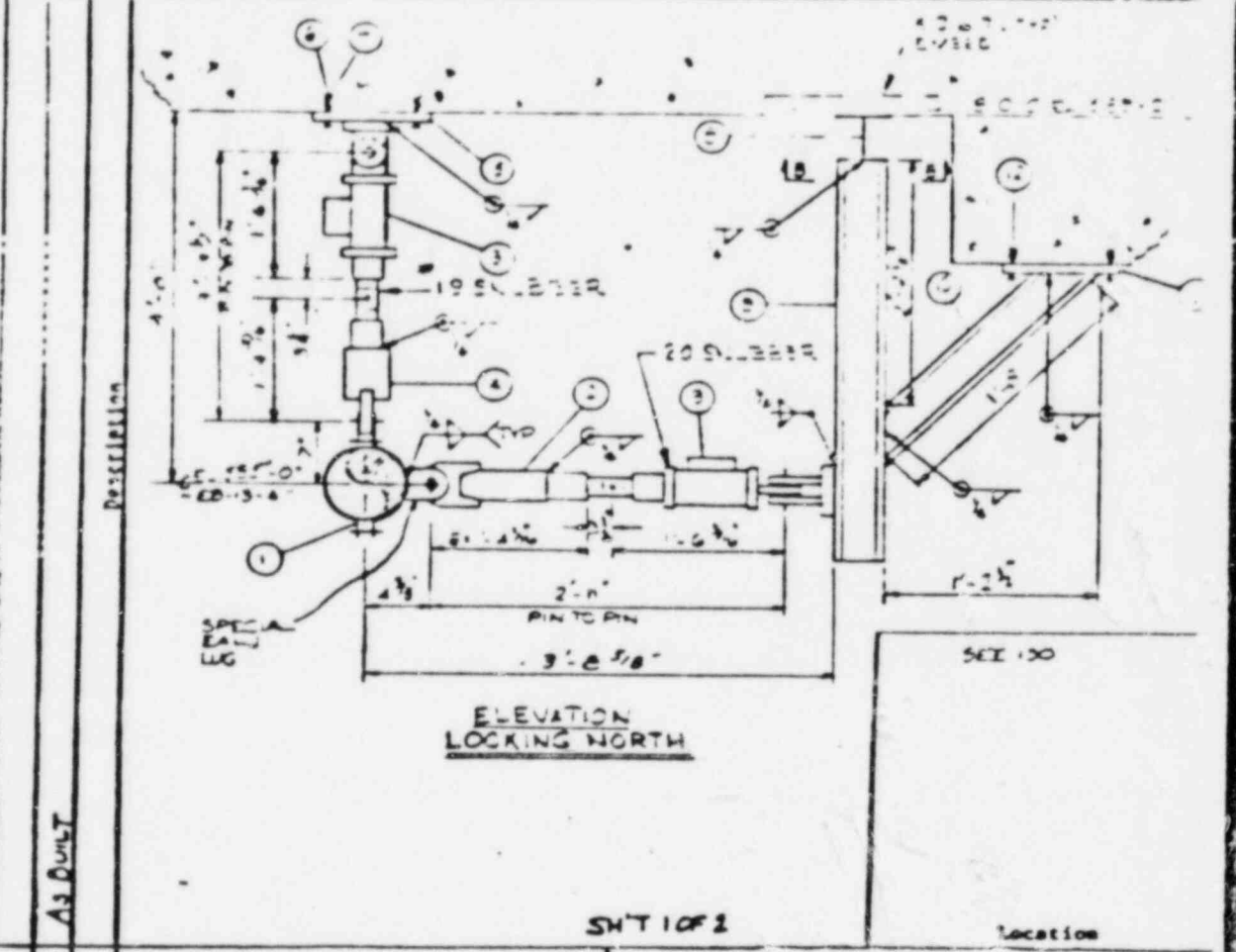
REV.	DATE
01	11/24/79
02	3/12/82
03	
04	
05	
06	
07	
08	
09	
10	

UNITED STATES

01/ AS BUILT

REV. DATE	RECHTEL AND ARBOR, MICHIGAN	SYSTEM: STEAM TO P. BB TURBINE
	PALISADES PROJECT JOB 12447	PLANT AREA/ROOM: G/TURBINE
	CONSUMERS POWER COMPANY PALISADES	PAID: M-207
		ISOMETRIC: M-101-EBD-G-1
		REF. Dwg: M-53
		CONNECTION TO: EBD-G-112

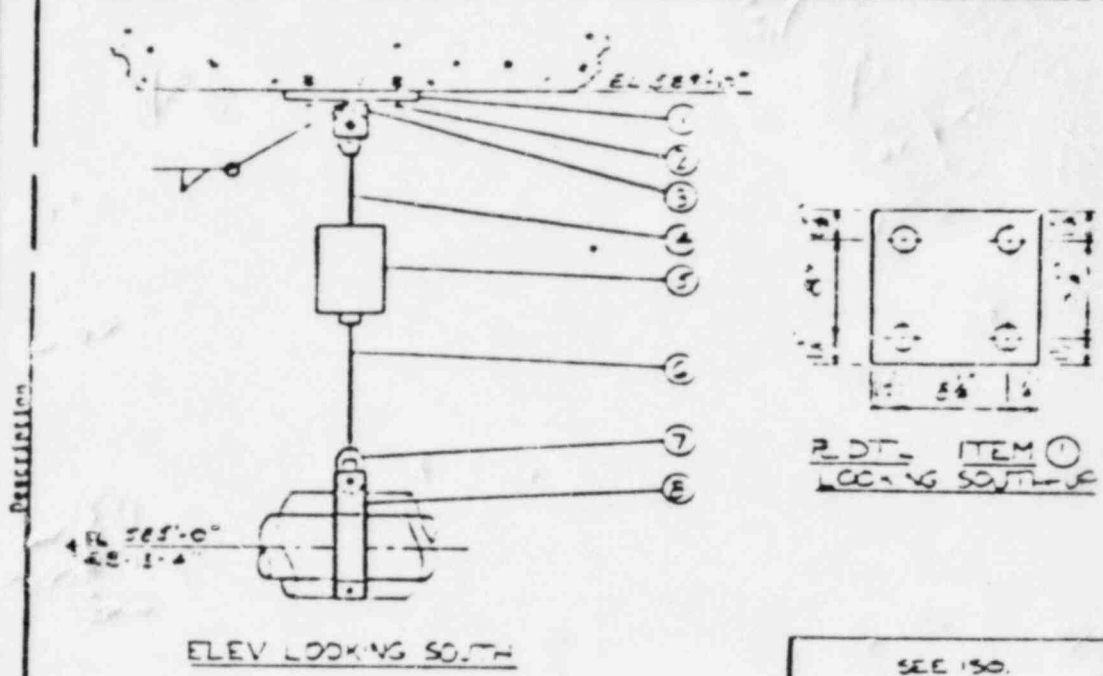
REV. DATE	1	1/2" DIA. 303 ST. CLAMP ON 8" DIA. W/ LOCK W/ NUTS W/ WASHERS
	2	PART 04270, P. STON. ROD CONN. W/ B'S (1/4" DIA. ST. 2427)
	3	PART 04243, G. ST. DIA. 1/2" BORE COIL POSITION SETTING #38 (W/ COIL)
	4	LOCATION: ALL FL. DOG E. FACATION OR EQUAL OVER ALL STRUCT. LEGS
	5	P. 1/2" DIA. 1/2 LG
	6	PART 02 5/8" CONK. P. STON. (1/2" DIA.)



REV. DATE	RECHTEL AND ARBOR, MICHIGAN	SYSTEM: STEAM TO P. BB TURBINE
	PALISADES PROJECT JOB 12447	PLANT AREA/ROOM: G/TURBINE
	CONSUMERS POWER COMPANY PALISADES	PAID: M-207
		ISOMETRIC: M-101-EBD-G-1
		REF. Dwg: M-53
		CONNECTION TO: EBD-G-112

REV. DATE	SECRET ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	SYSTEM: STEAM-TO R-80 TURBINE PLANT AREA/ROOM: G/TURBINE PAID: M-207 ISOMETRIC: M-101-EBD-6-1 REF. Dwg: M-52
01/11/77	CONSUMERS POWER COMPANY PALISADES	

- | | |
|----------|---------------------------------|
| ITEM NO. | DESCRIPTION |
| 1 | 1/2" PIPING FASTENERS, 4 REQ'D. |
| 2 | 6000 WELDED BRACKET ATTACHMENT |
| 3 | 3/8" WELDED ROD ATTACHMENT |
| 4 | 1/2" WELDED ROD ATTACHMENT |
| 5 | 1/2" WELDED ROD ATTACHMENT |
| 6 | 1/2" WELDED ROD ATTACHMENT |
| 7 | STEEL WELDED BRACKET (2 REQ'D) |
| 8 | 4" PIPE SEE 3 FOR PIPE CLAMP |



REV. DATE	SECRET ANN ARBOR, MICHIGAN PALISADES PROJECT JOB 12447	SYSTEM: STEAM-TO R-80 TURBINE PLANT AREA/ROOM: G/TURBINE PAID: M-207 ISOMETRIC: M-101-EBD-6-1 REF. Dwg: M-52 Support/Restraint No: PB-12-479
01/11/77	CONSUMERS POWER COMPANY PALISADES COVERT, MICHIGAN	

AS BUILT

Stress 7:00-10:30
 Wap No. M-107
 Installation per
 3/ no, As-Built
 Evidence of Corrosion
 If yes, show on
 No. of Expansion
 Measured gap betw
 and back of sup
 Walkdown Inspect
 Signature
 Reviewer
 Signature
 UT Inspector Sign
 Discrepancies (Circled)
 Engineering Eval

2-10

Area/Room: G/TURBINE

System: P-88 TURBINE

Wap No. M-107

Revi: Ref. Dwg. No. M-32

Revi 14, 150 No. in 6" Rev. in Line No. 50-13-4

Mar. Dwg. 18-13-M3 9

Revi 8

ITEM 1

ITEM 2

ITEM 3

ITEM 4

ITEM 5

ITEM 6

ITEM 7

ITEM 8

LOOKING SOUTH

LOOKING NORTH

CONCRETE EXPANSION ANCHOR

Inspection per Detail Dwg. Yes No X

If no, As-Built Dwg. Complete Yes X No

Evidence of Concrete Cracking or Failure

If yes, show on sketch Yes No X

No. of Expansion Anchors: 4

Pipe Elevation: 587'-0"

Measured gap between concrete surface and back of support plate: 0"

Walkdown Inspector Signature: *Thomas R. Burt* Date: 11/20/22

Reviewer Signature: *Alan J. McNeill* Date: 1/15/23

Wedge	J	Wedge	Thread Engag.	Stud Dia.	Stud Project. Length	Stud Length	Embed. Length	For Wedge Pins/Trns, Washer, OK	Expanded Thread (in)	Nut	Comments
1	5	5	5	5/8"	5	5	5	Shell	Shell	Shell	Shell
2	5	5	5	5/8"	5	5	5	Shell	Shell	Shell	Shell
3	5	5	5	5/8"	5	5	5	Shell	Shell	Shell	Shell
4	5	5	5	5/8"	5	5	5	Shell	Shell	Shell	Shell

Inspector Signature: _____ Date: _____

Testing Inspector Signature: _____ Date: _____

Discrepancies (Circled) Yes/No Reported to Client

Discrepancies Resolved:

Repaired: _____

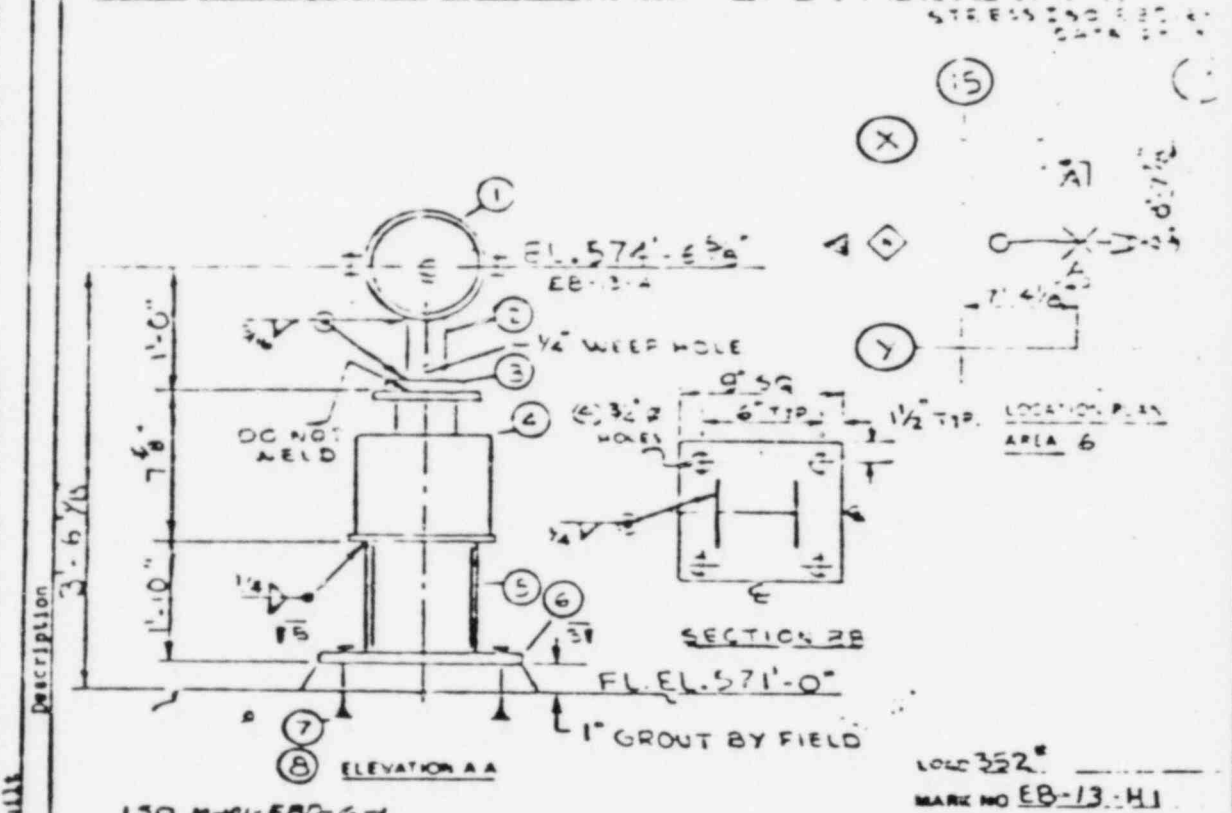
Rev Date Description

1/1 11/20/22 As-Built

1/2 1/15/23

REV. DATE	DESCRIPTION	DATE	BY
1	11-5-79		
2			
3			
4			
5			
6			
7			
8			
9			
10			

REV. DATE	DESCRIPTION	DATE	BY
1	11-5-79		
2			
3			
4			
5			
6			
7			
8			
9			
10			



150 M-01-EBD-6-1	ISSUED FOR CONSTRUCTION	MARK NO EB-13-H1
REVISIONS	BY	DATE
PALISADES PLANT	REC'D	150 EBD-6-1
CONSUMERS POWER COMPANY	RECEIVED	M-52
PIPE SUPPORT TURBINE BLDG	JOB NO	STEEL C-170-3
STEAM TOP-BB TURBINE	2447-033	DRAWING NO
		EB-13-H1

REQUIRE THIS COPY

System 10 AB TURBINE BLDG TURBINE Area/Room: 6/TURBINE
 Stress Plot 0330

Stress Prob: 3350 System: ^{3.2m} TO ADD TURBINE Bldg: TURBINE Area/Room: 6/TURBINE
 MFxp No: M-207 Rev: 1 Ref. Dwg. No: M-52 Rev: 14 Line No: EA-18-4 Hgr. Dwg: E0-13-W/ Rev: 0

Installation per Detail Dwg. Yes No Type _____
 If no, As-Built Dwg. Complete Yes No Wall _____
 Evidence of Concrete Cracking or Failure _____ Floor
 If yes, show on sketch Yes No Ceiling _____
 No. of Expansion Anchors: 4 Pipe Elevation: 574'6"

N/A

Measured gap between concrete surface and back of support plate: 0"

Walkdown Inspector
 Signature: Thomas Parra Date: 11-24-79
 Reviewer
 Signature: Allen J. ... Date: 1/1/80

CONCRETE EXPANSION ANCHORS

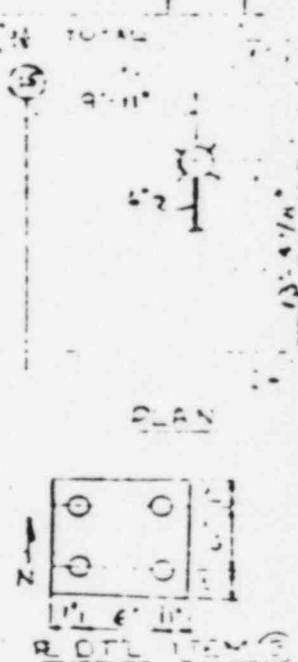
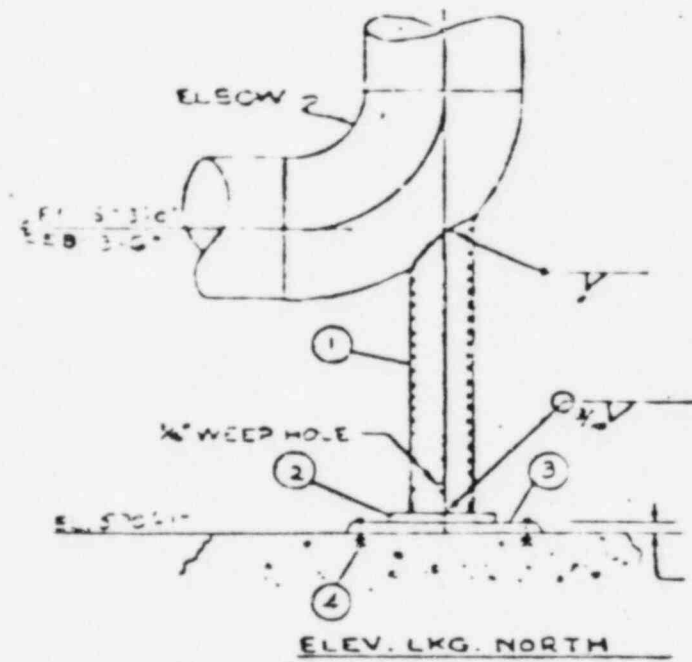
Wedge	Bolt No. (Per Sketch)	J or R	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Yehed. Length	Applied	Case/Branch	No. Pins/Trns	For height Master OK	Impress Thread in	Not Ant-tomed	Comments
Shell		S	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Yehed. Length			No. Trns	Shell OK	Test Method		
	1			FULL	1/2"	2"									
	2			FULL	1/2"	2"									
	3			FULL	1/2"	2"									
	4			FULL	1/2"	2"									

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: None Repair
 Engineering Evaluation: Acceptable Signature: _____ Date: _____ Unacceptable, Description Attached
 Discrepancies Resolved: PCR Other _____ Final Acceptance Signature: _____ Date: _____

Stress Prob: 03
 MFxp No: 203
 Installation per
 If no, As-Built
 Evidence of Concr
 If yes, show on a
 No. of Expansion
 Measured gap betw
 and back of sup
 Walkdown Inspector
 Signature:
 Reviewer
 Signature:
 Wedge
 Shell
 UT Inspector Sign
 Discrepancies (C
 Engineering Eval

REV. DATE	1.0	11-2-79	System	AUX. TURBINE
			Plant	STEAM SUPPLY
			Page	205
			Project	WINDWARD-6-1
			Ref. Dwg	M-53

L. C. WFD
 DRAWN
 10/27/79
 AS BUILT
 DIST. 11/11/79



150. M-10-EBD-6-1

THE A. S. WELLS & CO. E. C. W. 1955 CORP.	AUX. FW PUMP TURBINE PIPING SYSTEM STEAM SUPPLY
PROJECT NO. 150. M-10-EBD-6-1	REFERENCE DWG. M-169 REV. 0
DRAWN BY: JH	DATE: 11-2-79
CHECKED BY: JT	PROJECT NO. EB13-H924A NO. 1007-1

BERGEN-PATERSON PIPESUPPORT CORP.

DRAWN JH	CHECKED JT	DATE 11-2-79
PROJECT NO. EB13-H924A	NO. 1007-1	

Stress Prob: 03358 System: AUX. F.W. PUMP Bldg: TURBINE Area/Room: 6/TURBINE
 Exp No: M-207 Rev: Ref. Dwg. No: M-52 Rev: 4 ISO No: M-207-1 Rev: 1 Line No: 58-18-6 Ugr. Dwg: FO-3-N224A Rev: 1

Installation per Detail Dwg. Yes No TYPE
 If no, As-Built Dwg. Complete Yes No Wall
 Evidence of Concrete Cracking or Failure Floor
 If yes, show on sketch Yes No Ceiling

No. of Expansion Anchors: 4 Pipe Elevation: 578'-0"
 Measured gap between concrete surface and back of support plate: 0"

N/A

Walkdown Inspector
 Signature: *Thomas Beccapre* Date: 11-24-73
 Reviewer
 Signature: *Allen W. Smith* Date: 1/1/74

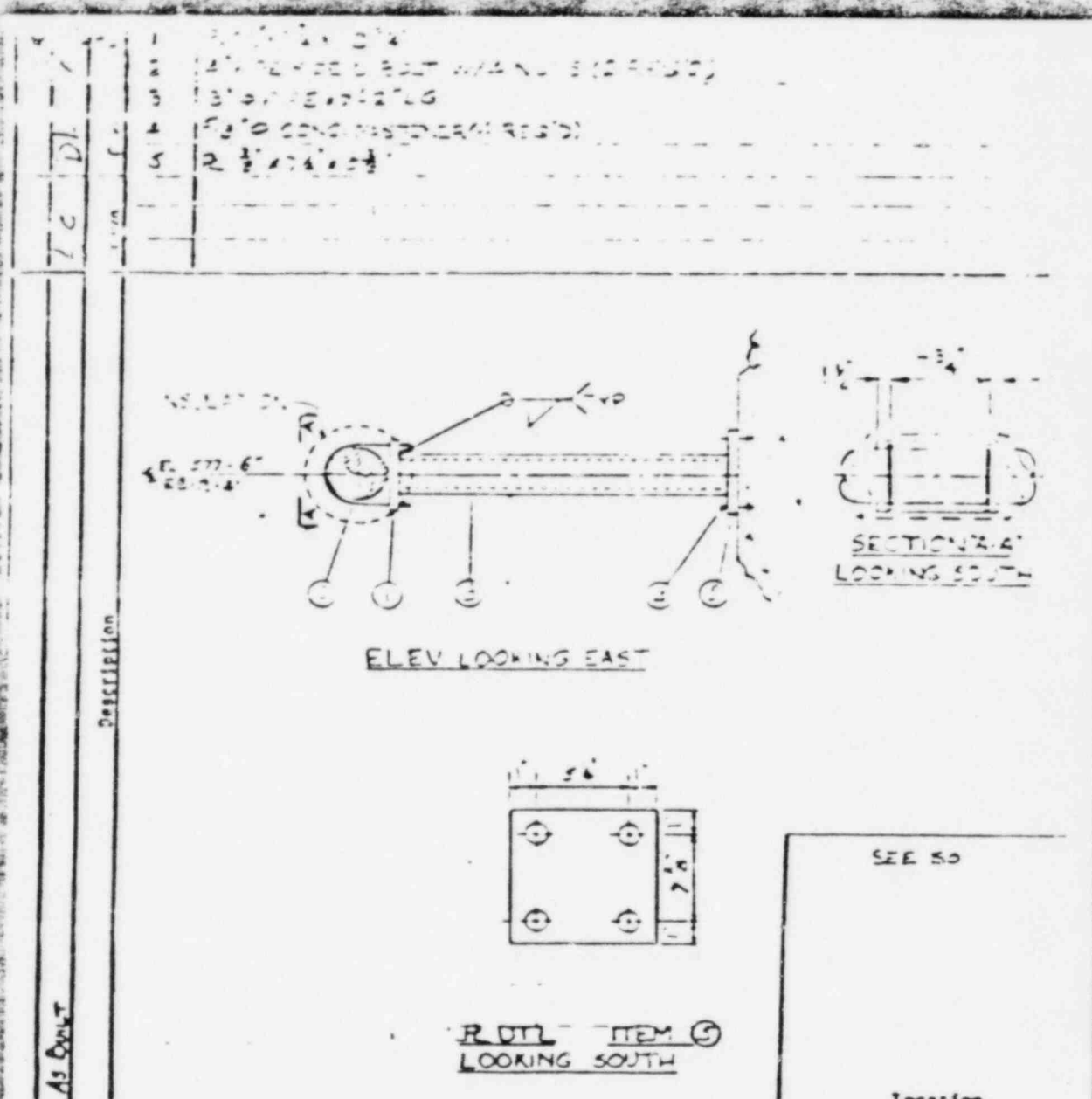
CONCRETE EXPANSION ANCHOR

Wedge	Bolt No. (Per Sketch)	J or R	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Applied Tor./Tern.	Case/Anchor Ident. No.	No. Trns. for Wedge-It	Pin/ Washer OK	Exposed Thread (in)	Nut Bottomed	Test Method	Anchor Retested	Comments
Shell	1	R	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length									
	2	R	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length									
	3	R	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length									
	4	R	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length									

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Resolved: Known Repair _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____

Stress Prob: 03358
 HPA No. 1
 Installed: If no, As-Built
 Evidence of Cracking or Failure: If yes, show on sketch
 No. of Expansion Anchors: 4
 Measured gap between concrete surface and back of support plate: 0"
 Walkdown Inspector Signature: *Thomas Beccapre*
 Reviewer Signature: *Allen W. Smith*
 Date: 11-24-73
 Date: 1/1-74
 UT Inspector Signature: _____
 Discrepancies (Circle) Yes/No Reported to Client: _____
 Discrepancies Resolved: _____
 Engineering Evaluation: _____

011	REV.	BECHTEL	SYSTEM: STEAM TO P-8B TURBINE
		ASH ARBOR, MICHIGAN	PLANS AREA/ROOM: 6/TURBINE
		PALISADES PROJECT JOB 12447	PAID: M-207
		CONSUMERS POWER COMPANY	ISOMETRIC: M-101-EBD-6-1
		PALISADES	REF. Dwg: M-52
		COVERT, MICHIGAN	SUPPORT/RESTRAINT No: EBD-6-426



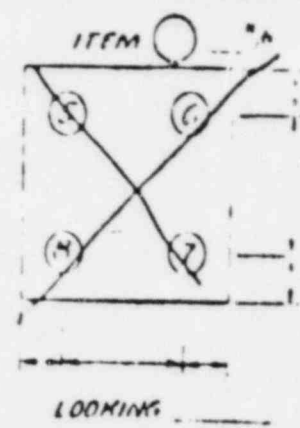
011	REV.	BECHTEL	System: STEAM TO P-8B TURBINE
		ASH ARBOR, MICHIGAN	Plans Area/Room: 6/TURBINE
		PALISADES PROJECT JOB 12447	PAID: M-207
		CONSUMERS POWER COMPANY	Isometric: M-101-EBD-6-1
		PALISADES	Ref. Dwg: M-52
		COVERT, MICHIGAN	SUPPORT/RESTRAINT No: EB-13-R02451

Stress Probe: **08958** System: **STEAM TO P-88 TURBINE** Wdg. TURBINE Area/Room: **G/TURBINE**
 Exp No: **M-207** Rev: Ref. Dwg No: **M-52** Rev: **4** ISO No: **400-1** For **2** Line No: **EO-13-4** Part No: **EO-13-K0140.1** Rev: **1**

Installation per Detail Dwg. Yes No Type: Wall
 If no, As-Built Dwg. Complete Yes No Floor
 Evidence of Concrete Cracking or Failure: Ceiling
 If yes, show on sketch Yes No

No. of Expansion Anchors: **4** Line Elevation: **577'-6"**
 Measured gap between concrete surface and back of support plate: **1/8" GAP UNDER STUD # 4**

Walkdown Inspector Signature: *Thomas Perro* Date: **11-24-79**
 Reviewer Signature: *Ally Lubwell* Date: **1/12/80**



Wedge	Bolt No. (Per Sketch)	J Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Comments
Shell	5	5	Thread Engag. <td>Bolt Size <td>Length S to C <td>Bolt Length <td>Embed. Length <td></td> </td></td></td></td>	Bolt Size <td>Length S to C <td>Bolt Length <td>Embed. Length <td></td> </td></td></td>	Length S to C <td>Bolt Length <td>Embed. Length <td></td> </td></td>	Bolt Length <td>Embed. Length <td></td> </td>	Embed. Length <td></td>	
	1	5		5/8"				
	2	5		5/8"				
	3	5		5/8"				
	4	5		5/8"				

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Discrepancies (Circle) Yes/No Reported to Client Discrepancies Reported to Client _____ Date: _____
 Engineering Evaluation: Acceptable Signature: _____ Date: _____

Stress Probe: **08958**
 Exp No: **205**
 Installation per: **As-Built**
 Evidence of: _____
 If yes, show on: _____
 No. of Expansion: _____
 Measured gap between: _____
 and back of support plate: _____
 Walkdown Inspector Signature: _____
 Reviewer Signature: *CL*

Wedge	Bolt No.	J Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Comments
Shell	5	5	Thread Engag. <td>Bolt Size <td>Length S to C <td>Bolt Length <td>Embed. Length <td></td> </td></td></td></td>	Bolt Size <td>Length S to C <td>Bolt Length <td>Embed. Length <td></td> </td></td></td>	Length S to C <td>Bolt Length <td>Embed. Length <td></td> </td></td>	Bolt Length <td>Embed. Length <td></td> </td>	Embed. Length <td></td>	

17

Stress Prob: 03358 System: ALUMINUM PUMP TURBINE Wldg TURBINE Area/Room: G/TURBINE
 HExp No: M-207 Rev: 1 Ref. Dwg. No: M-52 Rev: 1A 150 No. M-600-1 Rev: 1 Line No: 28-13-4 HExp. Dwg: 28-13-49248 Rev: 1

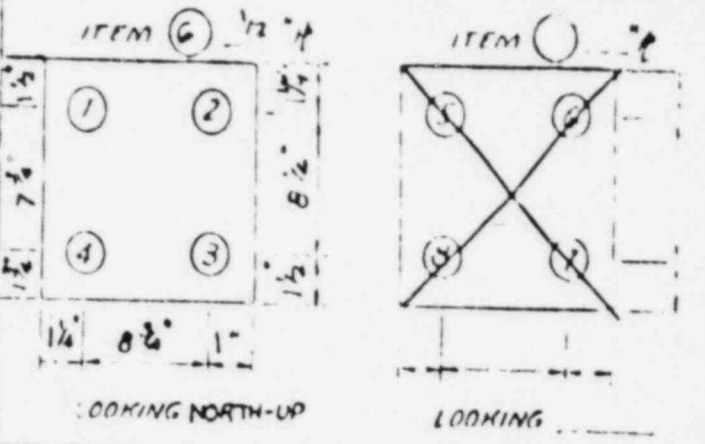
Installation per Detail Dwg. Yes No
 If no, As-Built Dwg. Complete Yes No
 Evidence of Concrete Cracking or Failure
 If yes, show on sketch Yes No
 No. of Expansion Anchors: 4 Pipe Elevation: 577.6'

TYPE
 Wall
 Floor
 Ceiling

Measured gap between concrete surface and back of support plate: 0"

Walkdown Inspector
 Signature: Thomas Berro Date: 11-24-79

Reviewer
 Signature: Alfred J. Hubert Date: 12/1/80



Wedge	Bolt No. (Per Sketch)	J	Wedge	Thread Engag.	Stud Dia.	Stud Project.	Stud Length	Embed. Length	Applied No. of Tor/Ten Turns	Exposed (Instead In)	Nut Bolt	Comments
Shell		S	Shell	Thread Engag.	Bolt Size	Length S to C	Bolt Length	Embed. Length	Applied No. of Tor/Ten Turns	Test	Method	
	1	S			5/8"							
	2	S			5/8"							
	3	S			5/8"							
	4	S			5/8"							

UT Inspector Signature: _____ Date: _____ Testing Inspector Signature: _____ Date: _____
 Engineering Evaluation: Acceptable Signature: _____
 Discrepancies: N/A FCR

Stress Prob: _____
 HExp No: _____
 Installation: _____
 If no, As-Built: _____
 Evidence of Cracking: _____
 If yes, show on sketch: _____
 No. of Expansion Anchors: _____
 Measured gap between concrete surface and back of support plate: _____
 Walkdown Inspector Signature: _____
 Reviewer Signature: _____
 Wedge: _____
 Shell: _____
 UT Inspector: _____
 Discrepancies Engineering: _____
 Discrepancies: _____